

Preliminary Construction Management Plan

Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA

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Document Approval

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Details of Revision Amendments

Document Control

The Project Manager is responsible for ensuring that this plan is reviewed and approved. The Project Construction Manager is responsible for updating this plan to reflect changes to construction, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Manager and/or client before being distributed / implemented.

Revision Details

Revision	Details
Revision 1	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – Concept and Stage 1 SSDA
Revision 2	Preliminary issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment - SSDA
Revision 3	Preliminary issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA . Minor amendments to CMP, Construction waste Management Plan & Construction Traffic Management Plan (CTMP).
Revision 4	Updated to include response to submission comments and updated staging details.

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Part A: Overview

1. Structure of this Plan

This Construction Management Plan (CMP) forms part of the Project Management System (PMS). It is part of a suite of plans that together outline how the Nepean Hospital Redevelopment project will be managed to ensure an integrated approach to meeting contract requirements.

In addition to the Project Management Plan other Project Plans that interface with Construction Management Plan include:

- Safety & Health Management Plan
- Environmental Management Plan
- Quality Management Plan
- Engineering and Design Management Plan
- Completion Management Plan

This plan has the following structure:

Part A: Overview	<p>This section clearly defines:</p> <ul style="list-style-type: none">■ Purpose, scope and objectives of this plan■ Project specific requirements■ Overall Construction Methodology■ Construction Management Elements and Expectations
Part B: Implementation Plan	<p>This section outlines the key aspects for managing Construction on the Project including: (To be included in plan at later stage)</p> <ul style="list-style-type: none">■ Expectations■ How they will be met■ Responsibilities■ Associated deliverables
Appendices	<p>A list of appendices providing additional detail that supports this plan including:</p> <ul style="list-style-type: none">■ Site Management Plans■ Construction Traffic Management Plan (CTMP)■ Environmental Management Plan

2. Project Overview

2.1 Purpose and Scope

CPB Contractors has been contracted by Health Infrastructure NSW to provide construction consultancy services for the Integrated Nepean Hospital Redevelopment project.

The preliminary Construction Management Plan (CMP) describes the proposed overall construction methodology, as well as the supporting management system processes to ensure that CPB Contractors and its subcontractors perform the works safely and effectively. The plan applies to the construction of all permanent and temporary works under the Contract.

This Construction Management Plan has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) dated 22 November 2017 relating to the SSDA for the proposed Nepean Hospital and Integrated Ambulatory Services Redevelopment (Stage 1), and subsequent Response to Submission comments.

The following table presents the SEARs relevant to Construction Management, Traffic and Waste Management during the Construction Delivery Phase of the Stage 1 Building works and confirms that each of these items have been addressed in the preliminary Construction Management plan and Appendices.

Table 1: SEARs with Comments & Cross References

SEARs Item No.	Comments & References.
Item 5 – Transport and Accessibility	
<ul style="list-style-type: none">• traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and the cumulative impact of nearby construction projects, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.	The traffic management methodology including the movements and truck routes associated with the construction process are described in Section 3.10 of this plan titled "Traffic & Pedestrian Management", Appendix A Draft Site Management Plans and should be read in conjunction with Section 6 of the more detailed report in Appendix B titled "Construction Traffic Management Plan (CTMP)" prepared by ptc in consultation with CPB Contractors.
Item 13 - Waste	
<ul style="list-style-type: none">• Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site.	The management of waste during the construction process is described in section 3 Clause 3.13 of this plan and in more detail in Appendix C: Waste Management Plan.
Plans and Documents	
<ul style="list-style-type: none">• Preliminary Construction Management Plan, inclusive of a Preliminary Construction Traffic Management Plan detailing vehicle routes, number of trucks, hours of operation, construction program, access arrangements and traffic control measures;	Refer to report in Appendix B titled "Construction Traffic Management Plan" (CTMP) prepared by ptc in consultation with CPB Contractors.

This Plan is established in accordance with CPB Contractors 'The Way We Operate' framework and is the key document that integrates CPB Contractors project delivery requirements and client construction requirements

The Project Manager, with advice and input from senior construction staff, is responsible for the Plan.

RESPONSE TO SUBMISSIONS

The following table presents the Response to Submissions relevant to Construction Management, Traffic and Waste Management during the Construction Delivery Phase of the Stage 1 Building works and confirms that each of these items have been addressed in the preliminary Construction Management plan and Appendices.

Raised By	Comment	Comments and References
Transport NSW	<p>Comment The construction methodology for the proposed development should ensure that construction impacts are mitigated and do not impinge on pedestrians, cyclists and the operations of the bus network.</p> <p>Recommendation The Construction Traffic Management Plan, which would be prepared prior to construction, should ensure construction vehicles and construction activities minimises and mitigates impacts on pedestrians, cyclists and the operation of the bus network.</p>	<p>Refer to section 7.6.3. & 7.6.4 of the CTMP which advises the following:</p> <ul style="list-style-type: none"> i. A Traffic Control Plan (TCP) will be prepared by the construction contractor outlining the vehicular access points and traffic controller locations to minimise any risk to the pedestrians on the footpath. ii. No impact on cyclists & the bus network.
RMS	<p>A Construction Traffic Management Plan detailing construction vehicle routes, number of trucks, hours of operation, access arrangements and traffic control should be submitted to Council for approval prior to the issue of a Construction Certificate.</p>	<p>The CTMP provided has responded to the items noted and will be issued to Council prior to the issue of a Construction Certificate</p>
RMS	<p>All demolition and construction vehicles are to be contained wholly within the site and vehicles must enter the site before stopping. A construction zone will not be permitted on Great Western Highway and Parker Street.</p>	<p>CPB confirm the all demolition and construction vehicles are to be contained wholly within the site and vehicles must enter the site before stopping.</p> <p>A construction zone will not be required on Great Western Highway and Parker Street. Section 7.9 of the CTMP identifies that a work zone will be requested along Somerset St frontage as a separate application in due course.</p>
RMS	<p>A Road Occupancy Licence should be obtained from Transport Management Centre for any works that may impact on Great Western Highway and Parker Street traffic flows during construction activities.</p>	<p>Noted</p>
EPA	<p>The EPA anticipates that site establishment, demolition, bulk earthworks, construction and construction-related activities will be undertaken in an environmentally responsible manner with particular emphasis on:</p> <ul style="list-style-type: none"> > the site contamination remediation action plan accompanying the EIS > compliance with recommended standard construction hours, > intra-day respite periods from high noise generating construction activities (including jack 	<p>CPB confirm that Site remediation will be completed as per the remediation action plan. Refer to section 3.7.2.7 of this report.</p> <p>CPB have requested the following construction hours:</p> <p>Monday to Friday 7am to 6pm, Saturday 7am to 5pm Sunday/ Public Holidays- No work</p> <p>Justification of these working hours are noted in Appendix D <i>Construction Noise & Vibration Management Plan</i></p>

	<p>hammering, rock breaking, pile boring or driving, saw cutting),</p> <ul style="list-style-type: none"> > feasible and reasonable noise and vibration minimisation and mitigation, > effective dust control and management, > erosion and sediment control, and > waste handling and management, particularly concrete waste and rinse water. 	<p>Use of respite periods is deemed not to be warranted in this case. Refer to the justification noted in Appendix D <i>Construction Noise & Vibration Management Plan for Respite</i></p> <p>Refer to Appendix D <i>Construction Noise & Vibration Management Plan</i> for noise and vibration mitigation measures.</p> <p>CPB confirm that effective dust control and management will be implemented as noted in section 3 of this report. 3.3 & 3.7.2.7</p> <p>CPB confirm that erosion and sediment controls will be implemented as noted in section 3 of this report. 3.3 & 3.7.2.7</p> <p>CPB confirm that waste handling and management will be complete as noted in section 3.7.2.8 & Appendix C.</p>
<p>EPA</p>	<p>Waste control and management (general)</p> <p>The proponent should manage waste in accordance with the waste management hierarchy. The waste hierarchy, established under the Waste Avoidance and Resource Recovery Act 2001, is one that ensures that resource management options are considered against the following priorities:</p> <p>Avoidance including action to reduce the amount of waste generated by households, industry and all levels of government.</p> <p>Resource recovery including reuse, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources</p> <p>Disposal including management of all disposal options in the most environmentally responsible manner.</p> <p>All wastes generated during the project must be properly assessed, classified and managed in accordance with the EPA’s guidelines to ensure proper treatment, transport and disposal at a landfill legally able to accept those wastes.</p> <p>The EPA further anticipates that, without proper site controls and management, mud and waste may be tracked off the site during the course of the project</p> <p>Recommendation</p> <p>The proponent be required to ensure that :</p> <ol style="list-style-type: none"> (1) all waste generated during the project is assessed, classified and managed in accordance with the EPA “Waste Classification Guidelines Part 1: Classifying Waste” , November 2014 and the 2016 Addendum thereto; (2) the body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to prevent any spill or escape of any dust, waste, or spoil from the vehicle or trailer; and (3) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site, is removed before the vehicle, trailer or motorised plant leaves the premises. 	<p>CPB confirms that all waste generated will be disposed in accordance with the EPA “ Waste Classification Guidelines Part 1: Classifying Waste” , November 2014 and the 2016 Addendum thereto, and as specified in Appendix C of this report.</p> <p>CPB confirms that the body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to prevent any spill or escape of any dust, waste, or spoil from the vehicle or trailer; as noted in section 3.9 of this report.</p> <p>CPB confirms that mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site, is removed before the vehicle, trailer or motorised plant leaves the premises; as noted in section 3.9 of this report.</p>

EPA	<p>Waste control and management (concrete and concrete rinse water)</p> <p>The EPA anticipates that during the course of the project concrete deliveries and pumping are likely to generate significant volumes of concrete waste and rinse water. The proponent should ensure that concrete waste and rinse water is not disposed of on the project site and instead that -</p> <p>(a) waste concrete is either returned in the agitator trucks to the supplier or directed to a dedicated watertight skip protected from the entry of precipitation, and</p> <p>(b) concrete rinse water is directed to a dedicated watertight skip protected from the entry of precipitation or a suitable water treatment plant.</p> <p>Recommendation</p> <p>The proponent be required to ensure that concrete waste and rinse water are</p> <p>(a) not disposed of on the development site, and</p> <p>(b) prevented from entering waters, including any natural or artificial watercourse.</p>	<p>CPB confirms that waste concrete is either returned in the agitator trucks to the supplier or directed to a dedicated watertight skip protected from the entry of precipitation; as noted in section 3.7.2.8 & Appendix C of this report</p> <p>CPB confirms that concrete rinse water is directed to a dedicated watertight skip protected from the entry of precipitation or a suitable water treatment plant; as noted in section 3.7.2.8 & Appendix C of this report</p>
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Table 2: Response to Submission with Comments & Cross References

2.1.1 Scope of work

The objective of the Integrated Nepean Hospital Project is to complete a major re-development of Nepean Hospital Campus and provide an advanced integration with existing community health centres within the surrounding wider Penrith wider LGA.

The concept plan proposal is for a new public hospital with ancillary services, including building footprints and envelopes, indicative uses, access, loading, landscaping and parking. BVN has provided plans detailing the indicative internal layout of the Stage 1 Building under the concept plan, involving:

- A fourteen (14) storey hospital tower comprising approximately 53,000m²; and
- Links between the existing buildings and Stage 1 Building.

The Stage 1 Building will include:

- A new clinical services block
- A new and expanded Emergency Department
- 16 new operating theatres
- 18 birthing suites in new accommodation, an increase of ten
- A new Neonatal Intensive Care Unit
- More than 200 overnight beds in new accommodation
- A new Helipad
- New Community Health Services
- Expansion of medical oncology services

2.1.2 Purpose of this CMP

This preliminary CMP relates to Stage 1 Building works which will include:

- Site Mobilisation
- Perimeter Piling
- Bulk Excavation
- Remediation
- Base structural works including In-ground services
- Reinforced Concrete and PT Concrete Superstructure
- Facade
- Fitout & Services
- Civil & Landscape works

2.2 Construction Contract Requirements

Table 2: Construction Contract Requirements, sets out the minimum client requirements as defined in the following Contracts:

Table 2: Construction Contract Requirements (To be completed on award of Contract)

Contract Reference	Content requirements	Where addressed	Comments
Main Works GC21 E2 Preliminaries ECI V4 GC21 E2 General Conditions GC21 E2 HI Special Conditions V4	<ul style="list-style-type: none"> ▪ General Conditions ▪ Documents ▪ Contracting ▪ Administration ▪ Site ▪ Environmental Protection ▪ Materials and Workmanship ▪ HI Additional Preliminaries ▪ Schedule to Preliminaries 	<ul style="list-style-type: none"> ▪ Preliminaries ▪ General Conditions ▪ Special Conditions 	Nil

2.3 Objectives and Targets

The Construction objectives and targets set out in Table 3: Objectives and Targets below are designed to facilitate the management and implementation of construction activities for the Integrated Nepean Hospital Project.

Construction performance will be monitored and work processes reviewed to improve, innovate and learn. Employees are responsible for complying with relevant procedures, reporting and rectifying non-compliance, and actively participating in quality meetings, committees and various training sessions.

Table 3: Objectives and Targets

Objectives	Measure	Target
Ensure that the Project is constructed in accordance with the Contract requirements and the objectives of the Principal	Achievement of technical completion	Deliver project as per programmed date
Provide appropriate resources, management systems and support to ensure that construction of the Project is delivered within program and budget objectives	Monthly review of program Monthly review of budget	Minimal variance between onsite works and program

2.4 Project Management System

The Project Management System (PMS) is based on the requirements of the CPB Contractors management system and has been specifically tailored to ensure compliance with the principal's contract requirements. The Project Management Plan provides more detail about The Way We Operate and the process adopted to deliver against the Principal's overall requirements.

The Way We Operate guides the way the overall project will be managed to meet client and other stakeholder requirements.

The CPB Management System has been developed and implemented to ensure a consistent approach to project delivery. The management system comprises the following components:

- A Policy is a statement of strategic intent and commitment and defines the minimum mandatory requirements that CPB Contractors expects all levels of the organisation to comply with.
- The Project Management Plan outlines how the Project will be managed and it is supported by a suite of functional management plans.
- Procedures and Work Instruction specify how to undertake and control specific activities. They also list accountable roles and the tools and knowledge to be used. Where appropriate and approved by the respective Business Unit functional manager, project specific procedures may be produced to reflect specific project circumstances.
- Tools are preformatted documents such as forms and templates that are required to be completed as part of a Procedure.
- Knowledge documents are reference material to provide context, additional information or guidance to a Policy or Procedure.
- Business Applications are the software tools used to manage our business and support our operations.

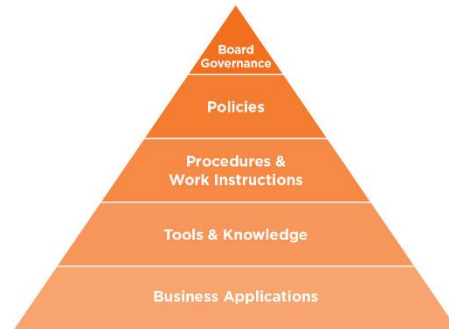


Figure 1: CPB Contractors Management System

2.5 The Safety Essentials

The CPB Contractors Safety Essentials set out the minimum, non-negotiable requirements to manage Safety Essential related tasks on The Integrated Nepean Hospital Redevelopment Project. The Safety Essentials are a suite of controls for critical safety risks that have been identified through data analysis that would have given rise to the potential for serious injury, if they were not understood and had appropriate controls in place.

The Safety Essentials support and reinforce the CPB Management System including the Project Management System – they do not replace them. Refer to the Safety & Health Management Plan for additional information.

3. Construction Methodology

3.1 Critical Construction Issues

The Integrated Nepean Hospital Redevelopment will be undertaken within a live health care environment including all Hospital buildings and facilities on the Nepean Campus. CPB is responsible for the staging and sequencing of construction works in order to minimise the impact to the operations of the Integrated Nepean Hospital Precinct.

Key principles include:

1. **The Integrated Nepean Hospital Precinct and all facilities will continue to be an operating hospital environment for the duration of the Works.**
2. **Separation of Construction Works from Hospital Operations** to ensure:
 - a) The safety of hospital staff, visitors, patients and visitors.
 - b) Segregation of construction activities to minimise impacts to hospital operations.
3. **Enabling the continuation of hospital operations** – All existing hospital facilities will continue to operate at full capacity during the Delivery Phase. Hospital operations should not be disrupted during the Works. This is to be undertaken through the staging and sequencing of works.
4. **Early Notice of Disruptions** – where disruptions (noise, vibration, dust, services shut downs, closure of pedestrian or vehicle paths/access points, etc are necessary) early notice will be provided to the Principal in accordance with the Disruption Notice process. Greater than 10 days' notice will be required for technical or extensive disruptions. CPB will allow appropriate time to prepare, review, and submit an appropriate disruption notice. Consultation will occur with the Principal, Integrated Nepean Hospital and all other relevant stakeholders to confirm an acceptable time/date/methodology for disruptions. Disruptions may be required to be completed out of normal working hours. This is detailed in the CPB Interface Management Plan.
5. **Infection Control** – ensure the infection control of the hospital is maintained. This includes external construction works on the campus and any locations of construction in the existing hospital environment. The infection control of existing facilities must not be compromised by construction works.
6. **Provision of temporary services/measures to support disruptions** – where major disruptions are required to the Hospital such as service shut downs, or change of entry points, temporary arrangements such as alternative entry points, back up services, etc will be provided to the satisfaction of the Principal to facilitate the continued operation of the hospital.
7. **Maintaining the compliance of all existing facilities** – during the works interface or connection with existing buildings or engineering system will be required. The Contractor must ensure the compliance and occupation of all existing facilities is maintained at all times.

3.2 Safety Considerations

On this Project, the following CPB Contractors defined high risk work tasks have been identified through Project planning and the risk management processes:

- Working at heights greater than 2 metres;
- Working near live traffic;
- Working near live services;
- Working in and around mobile plant and equipment;
- Electrical work;
- Work involving temporary works;
- Mobile cranes and lifting operations;
- The demolition of the whole or part of a structure that is either load-bearing or is related to the physical integrity of a structure;
- Any disturbance of or likely to involve any disturbance of, asbestos;
- Work in or near a confined space;
- A shaft or trench that is deeper than 1.5 metres;

- Work carried out on or near pressurised gas distribution mains or piping, or:
 - Chemical, fuel or refrigerant lines;
 - Energised electrical installations or services;
- Work in an area that may have a contaminated or flammable atmosphere;
- Tilt-up or precast concrete;
- Work on, in or adjacent to a railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians;
- Work where there are artificial extremes of temperature;

All Safety and Health risks, including the Safety Essentials and the Business defined High Risk Construction work tasks, must be managed through the application of the risk management processes, as follows:

- The Project Risk Register;
- Project Management Plan;
- Construction Area Risk Assessment;
- Construction Area Plan;
- Work Packs;
- Safe Work Method Statements; and
- Pre-Start Briefings.

3.3 Environmental Considerations

As with all Environmental Hazards, Significant Environmental Hazards have been identified through the review and analysis of environmental reports, contractual documents, community and legal compliance requirements relating to the Project and professional experience. Each of the Sub Plans listed below will be regularly reviewed during construction as the project risks are reviewed.

For further detail refer to;

Table 4 Environmental Hazards, Risks & Sub Plans

Environmental Hazards (Aspect)	Associated Significant Environmental Impact (Risk)	Environmental Sub Plans (Part C)
Clearing Works/ Inadvertent damage to vegetation	<ul style="list-style-type: none"> • Loss of or harm to flora or fauna 	Flora and Fauna Management Plan
Demolition Earthworks	<ul style="list-style-type: none"> • Soil erosion and sedimentation • Impact to natural water courses • Contamination of soil and water 	Soil and Water Management Plan
	<ul style="list-style-type: none"> • Noise and vibration affects to community and residents 	Noise & Vibration Sub Plan
	<ul style="list-style-type: none"> • Environmental impact of contaminated substances • Uncontrolled spills contaminating soil and water • Uncontrolled management of asbestos contamination 	Hazardous Substances Sub Plan
	<ul style="list-style-type: none"> • Uncontrolled waste removal and non-conformance to waste reporting to Government 	Waste Management Plan
	<ul style="list-style-type: none"> • Air pollution affecting people, fauna and water. 	Air Sub Plan
Management and storage of hazardous materials	<ul style="list-style-type: none"> • Off-site water and land quality impacts as a result of poor hydrocarbon/chemical management • Failure to manage/report contaminated materials resulting in offsite soil and water impacts 	Soil and Water Management Plan Unexpected Discovery Contamination process Hazardous Materials Management Plan Safety Management Plan

3.4 Community and Stakeholder Considerations

CPB will identify and proactively manage community and stakeholder issues and risks.

CPB identify the following list of stakeholders whose interest will need to be identified and documented:

- Ministry of Health (MoH)
- Health Infrastructure (The Principal)
- Nepean Blue Mountains Local Health District (NBMLHD)
- Nepean Hospital (NH)
- Sydney University (SU)
- Statutory Authorities
- Western Sydney University (WSU)
- Patients
- Families
- Staff
- Local community and businesses
- Emergency Services
- Local Council
- Fire Brigade
- Total Asset management (TAMs)
- Private Hospital

The principal community and stakeholder issues identified on the Project are:

ISSUE	CONTROLS
Noise:	<ul style="list-style-type: none"> ▪ All reasonable, practicable steps to reduce the noise by the use of screening, acoustic hoarding, engine silencing and alternate processes to reduce noise where possible. ▪ Construction activities will be monitored such that noise levels at the property boundary are within authority requirements at all times. For adjacent buildings within the hospital grounds, CPB will engage Acoustic Logic Engineering to carry out a review of the projected noise levels on the adjacent hospital owned buildings to allow appropriate acoustic controls to be established and CPB will actively engage with the hospital and its stakeholders on this work method.
Vibration:	<ul style="list-style-type: none"> ▪ Implement vibration monitoring, if required and respond to any concerns raised.
Dust:	<ul style="list-style-type: none"> ▪ Dust generated during the works is to be controlled by regular control measures such as on – site watering. ▪ Vehicle wash down areas are to be established to minimise mud and soil being carried onto public roads ▪ Trucks leaving the site with spoils or demolition material are to be covered.
Access:	<ul style="list-style-type: none"> ▪ Maintain local access at all times where possible. Communicate in a proactive way between the project and hospital team. ▪ Access to site is identified in the traffic management plan and agreed with the hospital team.

ISSUE	CONTROLS
Traffic:	<ul style="list-style-type: none"> As much as practicable traffic arrangements should be maintained.
Hours of work:	<ul style="list-style-type: none"> Will be in accordance with the DA, SSDA and Ref conditions
Environment:	<ul style="list-style-type: none"> Any hazardous substances identified during the undertaking of works will be classified, stored, transported and disposed of according to the DECCW requirements and other applicable legislation and Australian guidelines. Erosions and sediment control measures are to be provided in accordance with "Landcom's Managing Urban Stormwater, Soils and Construction Guidelines", and the "Blue Book" is to be maintained regularly after rainfall events. Erosion and Sediment control measures are not to be removed until disturbed areas have been stabilised.
Waste:	<ul style="list-style-type: none"> Waste management Plan is to be developed with an appropriately qualified contractor prior to works commencing.

3.5 Quality Considerations

The Quality objectives and targets set out in Table are designed to facilitate the management and implementation of quality for Integrated Nepean Hospital and Integrated Ambulatory Services Redevelopment project.

Quality performance will be monitored and work processes reviewed to improve, innovate and learn. Employees are responsible for complying with relevant procedures, reporting and rectifying non-compliance, and actively participating in quality meetings, committees and various training sessions.

Table 5: Objectives and Targets

Key Result Area	Objectives	Measure	Target
Performance indicators that demonstrate quality outcomes	Cost of Non Conformance	All NCR costs/impacts to be recorded	100%
		NCRs classified as Class 1, 2, or 3	Nil Class 1
	Understand root causes of nonconformance	All NCRs categorised by root cause	100%
Maintain compliant Project Management System	Actions identified to close out BU Project Management Systems Audit NCRs	Actions closed within agreed timeframes	>90%
Reporting monthly key quality risks identified	Effectiveness of control for identified quality risks	Input monthly into the BU dashboard	≤3

3.6 Temporary Works Considerations

CPB will nominate a Temporary Works Co-ordinator who will administer the procedure and coordination of the temporary works encompassing details such as:

- A Work Pack briefing Identification of the temporary works required and preparation of a design brief
- The temporary works is to be designed by a competent person
- The design is to be reviewed to ensure meets the brief
- The design is to be certified (by designer – may require independent consultant)
- The design must be approved by the Permanent Works Designer if it has an impact on existing or new permanent works
- Must be undertaken covering TW installation, loading and removal. Covers SWMS safety requirements and ITP Hold Point requirements
- Erection to be carried out by competent personnel in accordance with the SWMS
- Any modifications to design or equipment to be referred back to the Temporary Works Designer (including check against permanent works)
- Completed temporary works to be inspected and approved for use by a competent person and/or designer before loading
- Loading to be in accordance with the design method and the SWMS
- Temporary Works to be dismantled with care in accordance with the SWMS.

A site specific Temporary Works Procedure has been developed for the Nepean Hospital Redevelopment and is implemented for all temporary work onsite. Refer to 180323 *Temporary Works Guidelines REV 1* for procedure.

3.7 Construction Staging, Sequence or Method

3.7.1 Site Establishment

The construction management of all of the early & main works (Stage 1 Building) will be managed by CPB within the existing population health building, and will be supported by site amenities and site offices around the main site.

During the early phases of construction satellite site sheds will be located within the existing site boundary to accommodate the onsite workers. This accommodation will then be relocated to the East of the Drug & Alcohol center in the existing Drug & Alcohol Carpark and increase incrementally as required to service the men onsite. The construction of this accommodation will be completed under a separate REF approval.

Workers site sheds are proposed to be double stack configuration, which will accommodate approximately 600 men at its peak.

3.7.2 Early Contractor Involvement (ECI)

As part of the Planning Phase CPB proposes the following early works packages be completed to enable structure trades to continue following the completion of the early works:

3.7.2.1 Asbestos, Dust, Noise & Vibration Monitoring (to be completed under separate REF)

Prior to any works commencing CPB will undertake detailed monitoring of the site to confirm background/base levels of asbestos, dust, noise and vibration. This will allow realistic comparisons to be completed during the early works stages of construction.

3.7.2.2 Construction of Fire Brigade and Pedestrian Access (to be completed under REF)

A new Fire Brigade laydown area and Childcare access road will be constructed to allow the site fencing and excavation works to commence. The current position of the main works excavation obstructs the current Fire Brigade laydown area at North block, and also closes access to the childcare centre driveway.

Pedestrian access must also be maintained to allow safe access/egress from North/East Block. This will be constructed to the North of North Block and the North/East of East Block.

3.7.2.3 Services Diversion (to be completed under REF)

Following the construction of the new Childcare access and Fire Brigade laydown area services diversions can commence for the relocation of the in-ground hydrant and gas main.

3.7.2.4 Site Fencing (to be completed under REF)

Once the services diversions have been completed the site fencing will be installed in its permanent location. This will surround the bulk excavation works and allow the lighting and communication disconnection to take place.

3.7.2.5 Services Disconnection (to be completed under REF)

A number of services must be disconnected to allow stormwater and bulk excavation to commence. These include: electricity, gas, communication, hydrant lines and all aboveground assets. Appropriate contactors will be engaged to complete this work.

3.7.2.6 Stormwater Diversions (to be completed under REF)

Once all in-ground services are disconnected the Stormwater works will commence. This is required to facilitate the bulk excavation works and ensure that all existing stormwater services are re-diverted around the bulk excavation zone to maintain hospital operations. Where required shoring boxes will be utilised, and all works will be battered/protected to mitigate any risk of working within an excavation. Permanent Stormwater works will be undertaken under the SSDA as noted in Bonacci's Stormwater drawings

3.7.2.7 Bulk Excavation (to be completed under SSDA)

Access to the project during the bulk excavation works will be from the North of the Childcare Centre. This will be the primary access for the project duration. Following this CPB will be remediating the site as noted in the RAP provided by JBS&G on 1/11/18 to ensure all areas of contamination within the project boundary are remediated. Approximately 24,000m³ of soil will be removed from the site to a registered waste facility. These will mainly be carted using 'Truck & Dogs' or 'Semi-Trailers'. Dust mitigation measures will be implemented during the bulk excavation works such as the use of water carts, rumble grates, wash-down bays and sealing of all haul roads where possible. Street sweepers will also be utilised to clean roads and ensure no material is tracked onto public roads.

CPB will construct environmental and sediment controls as noted in the Bonacci Sediment and Erosion control plan. Additional methods will be utilised to ensure no untreated/unfiltered water discharges from the project.

As part of these works the batters to the South of the project will require stabilisation to protect them against weathering. This will be completed by the bulk excavation contractor.

3.7.2.8 Piling (to be completed under SSDA)

Piling works will be completed towards the middle of 2019. A piling platform will be constructed at the completion of the bulk excavation works to facilitate the piling rig. There are 91 foundation piles, and 50 core piles to be completed as part of this work, as well as approximately 8 crane base piles.

All concrete and construction waste will be properly disposed of or recycled. Excess concrete will be discharged into a dedicated concrete bin and recycled to a designated waste facility.

3.7.3 Structure

The sub-structure and suspended pours will follow bulk excavation and piling. The ground floor slab will be poured sequentially, followed by the construction of the main core jump form. The columns and suspended slabs will then follow the internal/external cores up each level of the structure. The suspended slabs on each level will be divided into sections as such to provide more manageable sized pours and staged construction.

Perimeter scaffolding will be implemented to provide edge protection during the construction phase, as well as to assist in the construction of the building Façade.

Concrete for the main structure will be delivered to site in agitator trucks, and pumped via mobile/tower boom pumps. Pumping stations will be located within the site on the new road to the north of the structure.

All concrete and construction waste will be properly disposed of or recycled. Excess concrete will be discharged into a dedicated concrete bin and recycled to a designated waste facility.

3.7.4 High Level Services and Rough In

As formwork back propping is removed, the roughing in of high level service and other services will commence. This will include fire services, duct work, power, security, comms, medical gasses, pneumatic tubes, nurse call, and lighting cabling.

Services installation will be undertaken from scissor lifts, and all high level services will be completed prior to the commencement of fit out trades.

3.7.5 Fitout, Fit off and Finishes

Following high level services, fit out trades will commence on each level as they become available. Studwork and framing will be installed to allow rough in of walls, sheeting, painting and fit off trades to follow. Each activity will be assessed and take preceding activities into account to identify any clashes between the activities.

3.7.6 Façade

The façade for the Stage 1 tower will commence immediately after the completion of the structure. Façade will be installed from the upper levels, and continue down to the base of the structure. As each floor is completed the scaffolding will be dismantled and follow the façade works down.

3.8 Site Logistics and Interfaces

3.8.1 Nepean Campus Sign In Protocol

- All CPB Contractor staff and subcontractors undertaking work around site are required to complete the Smartek Induction, unless they are working within the CPB site fencing boundary.
- All visitors planning to enter the CPB site must sign in to a visitors induction before entering the CPB construction site
- All workers/visitors must obey site signage

3.8.2 Waste Control & Management

Rubbish will be removed from each site using both lift able construction bins and wheelie type bins. The waste in these bins will be loaded into the larger 'skip' bins located in the building delivery/laydown area within the compounds. The majority of waste will be sorted onsite, using two bin types:

1. General rubbish bins – to be provided at all times, with offsite sorting
2. Metal bins – to be provided at all times for aluminium, reinforcement, copper and ductwork.

The disposal subcontractor will recycle material where possible and record waste volumes. A receipt summarising recycled and waste quantities will be issued to the contractor on a monthly basis.

The target for recycling of waste by the disposal subcontractor will be 75% of the total generated.

Refer to Appendix C for Waste Management Plan

3.8.3 Hours of work

The hours of construction are proposed to be restricted as follows:

- Mondays to Fridays: 7am to 6pm
- Saturdays: 7am to 5pm. Justification of these working hours are noted in Appendix D *Construction Noise & Vibration Management Plan*
- Sundays & Public holidays: No Work

Works may be undertaken outside these hours where:

- The delivery of materials is required outside these hours by the Police or other authorities, or
- It is required in an emergency to avoid the loss of life, damage to property and/or to prevent environmental harm, or
- Variation is approved in advance in writing by the Secretary or nominee

Due to the nature of construction in an operational environment, certain elements of the build may be engineered so as to avoid disruption to the adjacent hospital.

It is CPB Contractor's intention to integrate construction activities around the daily operations of the hospital to avoid any disruptions, with a focus on putting the safety and clinical operations of the users and public first.

3.8.4 Amenities

Site accommodation/amenities such as meal rooms, change rooms and ablutions/showers will be installed according to the requirements stipulated in the Safe Work Australia 'Managing the Work Environment and Facilities' Code of Practice December 2011.

During the early phases of construction satellite site sheds will be located within the existing site boundary to accommodate the onsite workers. This accommodation will then be relocated to the East of the Drug & Alcohol center in the existing Drug & Alcohol Carpark and increase in size incrementally to service the men onsite. The construction of this accommodation will be completed under a separate REF approval. The site workers will access the site via an entry of Somerset Street directly at the Drug & Alcohol Carpark.

Workers site sheds are proposed to be double stack configuration, which will accommodate approximately 600 men at its peak.

Following completion of the new Stage 1 Building, site accommodation will be set up in a designated location within the refurbishment building for the civil and landscaping works associated with the main entry works if required, where we expect it to accommodate 100 men at peak.

Refer to Appendix A, site management plans for the approximate site accommodation locations for the new Stage 1 Building.

3.8.5 Hoarding and fencing

Upon site possession, site fencing and hoardings will be established around the boundary of the site incrementally. The site hoarding/fencing will be dressed with shade cloth/graphics, with artwork provided by Health Infrastructure. The alignment of the site's hoarding/fencing will separate construction activities from ongoing health facility activities.

Early vehicle access to the site will be via the existing entry to the south of the Childcare Centre. This will be the primary access during the ECI works noted above. A new entry point layback will be created at the Drug & Alcohol Centre in the ECI phase under a separate REF approval prior to the bulk excavation works commencing. This will allow CPB Contractors to gain immediate mobilisation to the site upon possession of the on-grade car park, and support early commencement of works on the Stage 1 Building.

Public parking for the Drug and Alcohol facility will be redirected to an alternative parking location. The location of the alternative parking is still to be confirmed by CPB/Hi/CBRE.

Any graffiti, vandalism or damage to the fencing will be repaired as soon as practically possible.

3.8.6 Project signboard

Signboards will be placed on hoardings and fences near site entry points with details of the Contractor, Health Infrastructure, Local Health District, Project Manager, design team and in accordance with Australian Standards. Final details of the signboards will be reviewed and agreed with the Health Infrastructure prior to installation

Locations and style still to be advised subject to consultation with the Principal in the future.

3.9 Traffic and Pedestrian Management

The Construction Traffic Management Plan (CTMP) examines the impacts on traffic (i.e. vehicles and pedestrians) on the surrounding local road network and provides mitigation measures to address any traffic and/or transport implications associated with the construction works.

Onsite construction access routes are established, within the construction boundary, mainly according to the proposed layout to facilitate materials handling for tower/crawler cranes. Hoists will transport personnel and lighter materials within each building structure.

The following proposed mitigation measures have been identified for the duration of the construction works:

- Works Zone situated on Somerset Street
- Appropriate signs warning of trucks entering will be erected on the approach to any access point as per requirements of the certified Traffic Control Plan
- Promoting car-pooling and using site car-parking more efficiently – NO ONSITE PARKING
- Waiting construction traffic such as concrete or haulage trucks to be confined within the site boundary or sent back to original point of departure if not booked in for delivery
- Appropriate signs erected to warn vehicle drivers and, in particular, vulnerable road users such as cyclists and pedestrians, of restricted road and shoulder spaces due to construction activities
- Implementation of effective arrangements including advance warning signs and emergency access arrangements for any closure to surrounding road
- Vehicles transporting material to and from the construction site will be covered immediately after loading (prior to traversing public roads) to prevent wind-blown dust emissions and spillages
- All vehicles will be inspected and any mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the site, is removed before the vehicle, trailer or motorised plant leaves the premises
- In the event of a spillage of materials from construction vehicles, spilled material will be removed as soon as possible and spill kits will be available on the site.
- Access being maintained to neighboring properties and other land users throughout the construction phase
- Haulage vehicles being filled to capacity to minimise vehicle movements
- The preparation of Traffic Control Plans.
- Haulage vehicles during bulk excavation will be carefully managed and staggered as required to prevent congestion or obstruction at major road intersections providing access to the site.

3.9.1 Vehicle Access

The Construction Traffic Management Plan (CTMP) is a sub-plan to the Project Management Plan, and has been developed to ensure appropriate traffic control measures are undertaken on roads affected by construction traffic. Traffic control signage will be installed to ensure safe interface between construction traffic and the health facilities traffic movements.

Traffic control plans will be implemented by qualified traffic controllers where footpath and driveway works are required. Other traffic control plans will be implemented when undertaking works to connect to the health facilities. Segregation between the pedestrians and work area, and temporary pathways will guide pedestrians safely around the work site.

All truck deliveries will access the site via main entry point as nominated on the site plans. Trucks will be coordinated to exit the site via the gate staff. An approved waiting zone away from the site will be designated prior to entry of health facility precinct to minimise construction traffic in the work zone.

The Stage 1 Hospital site entry and egress will be via Somerset Street through Gate 1 during and following the Bulk Earthworks. The gate will be setback from Somerset Street, allowing trucks to turn into the site without blocking vehicle movement on the street.

Refer to CTMP in Appendix B

3.9.2 Pedestrian access

Site personnel will access the site through a gated entrance next to site accommodation and amenities at Somerset Street. Pedestrian paths for the workforce will be identified within the site with a view to causing the least disruption during construction works.

Pedestrian access will be maintained for the footpaths running adjacent to the site boundary on Somerset Street.

3.10 Contractor Parking

No onsite parking within the health facilities will be designated for contractors to minimise disruptions to hospital operations. A capark has been constructed at Rodgers Street to help alleviate some of the parking concerns around the project. CPB will be promoting carpooling and public transport on the project to help mitigate parking issues.

3.11 Emergency Management

Management plans and procedures will be implemented in accordance with the Work Health and Safety Regulation 2011. Emergency evacuation plans will define evacuation routes and muster points for each of the various stages of each of the Project sites. These plans will then become part of the site induction presented to all personnel. Site rules will also be established to prevent equipment or material being placed along emergency egress pathways or obstructing firefighting equipment.

Any changes to the Emergency Management Plan will be communicated at the earliest opportunity through weekly safety committee walks, subcontractor meetings and pre-start meetings. Random emergency evacuation drills will also be undertaken to train and test the workforce during the unlikely event of an emergency evacuation. Alternate egress pathways will be created and maintained during any works that may obstruct egress passageways.

Firefighting equipment will be installed in consultation with the Fire Services subcontractor and in accordance with the Building Code of Australia. Fire extinguishers will be made available during the structure and fit out stages as required.

3.12 Nurse Call System

A wireless nurse call system will be installed within both zone areas of the Main Building Works and main entry to eliminate the risk of vandalism associated with hard wired systems. The nurse call system will incorporate a site evacuation and public address system to allow an immediate response to onsite incidents during construction.

This nurse call system will be connected to the staffed first aid shed, with a remote pager system installed in case the first aid officer is out of the first aid shed.

3.13 Site Security

Security of both the main Tower Building and main entry sites will be provided through passive and active solutions.

3.13.1 Passive Security

- Fencing/hoarding will be erected to prevent intruders from entering the site
- The daily site lock up protocol will be undertaken at the end of each work day to ensure the site is secure overnight and on weekends
- The daily site opening protocol will be undertaken at the beginning of each workday to ensure the integrity of the site has been maintained
- The issue of site keys to personnel will be restricted.

3.13.2 Active Security

- Security measures will be taken during holiday periods to ensure the integrity of the site

- The contractor's and Principal's site office will be secured with an alarm system and security response service.

Note: After consultation between CPB Contractors, Health Infrastructure & users, CPB Contractors will seek to provide an appropriate level of patrolling security as required.

3.14 Materials Handling

CPB Contractors material handling configuration is in broad terms shown on the site management plans in Appendix A. These plans outline the logistics of how we propose to manage site entry, exit and overall site management.

Man and material hoists and loading platforms will be used on the Main Hospital Tower works structure to enable loading of materials between each level. All truck deliveries will access the site via main entry points, as nominated on the site plans. Trucks will be coordinated to exit the site via gate staff. An approved waiting zone away from site will be designated prior to entry of health facility precinct in minimise construction traffic in the work zone.

The material handling onsite will be maintained using the following lifting equipment to take delivery of materials, equipment and facilitating horizontal lifting around the site.

3.14.1 ECI Works

During the early works phase, all materials during the ECI phase will be unloaded with mobile cranes, forklifts, manitou, hiabs or excavators. Noise will be limited to the operating noise of machinery.

3.14.2 Stage 1 Tower

Unloading of deliveries during the main works will be completed with the following:

- 2 x Tower Cranes
- Mobile cranes for general lifting
- 2 x Dual material handling hoist
- All terrain forklifts.

2 x tower cranes will be selected for the main building works. These cranes have been selected for the following reasons:

1. Noise – This is an electric crane and virtually noise free. The diesel-powered tower crane noise is typically the most common source of noise complaint on large projects.
2. Speed – The cabin will be fully manned, improving the speed of the crane. Tower cranes have no daily setup time which improves daily lifting rates.
3. Slew arc – The crane has the ability to reach the material handling zone and the main structural core. This minimises the requirement of support mobile crane and site congestion.
4. The tower cranes will be located in accordance with the marked site plan in Appendix A. Support mobile crane will only be used for specialised and prolonged lifts that limit the boom capacity of the tower cranes.

Please refer to Appendix A, site management plans for the Tower Crane locations. A more detailed plan showing radiuses to the main building will be provided in future revisions of this Plan.

All pumping of concrete, changeover of rubbish bins, loading and unloading of delivery trucks and mobile crane setups will all be carried out within the compound boundary of each site.

3.15 Methodology for Environmental Protection:

3.15.1 General:

A draft Construction Environment Management Plan (CEMP) will be developed and documented to ensure CPB Contractors identifies key environmental hazards the various project locations and develops appropriate control methods to manage hazards.

CPB Contractors recognise sites are close to the existing health facilities, and that this may have potential impact on operations. The methodology for environmental protection shall be managed by the EMP, and will incorporate SSDA development approval requirements' including approved working hours once the conditions of the Application have been received.

3.15.2 Sub Plans to the EMP will include the following:

1. Dust Management Plan:

This sub-plan to the CEMP addresses the management of emissions to the atmosphere that may be caused by Project activities and have the potential to adversely affect the environment or community by affecting air quality.

2. Vibration and Noise Plan:

This sub-plan to the CEMP addresses the management of noise generated by project activities that have the potential to adversely affect the environment and/or community.

In conjunction with the Acoustic engineer and in collaboration with the Health Infrastructure, CPB Contractors proposed to develop a Noise and Vibration plan and will adopt the EPA Construction Noise Guidelines for airborne noise and the EPA's Assessing Vibration technical guidelines for vibration.

3. Air Quality Plan:

This sub-plan to the CEMP addresses the management of emissions to the atmosphere that may be caused by Project activities, and that have the potential to adversely affect the environment or community by affecting air quality.

4. Visual Management Plan:

The sub-heading in the CEMP addresses management of clean site conditions and external appearance that may impact on the surrounding public environment.

5. Waste Management Plan:

Waste will be generated from demolition, earthworks and general construction waste. CPB Contractors will develop a sub-plan to the CEMP to ensure waste originating from the Project is managed in an efficient, environmentally appropriate and legally compliant manner.

Refer to Appendix C for Waste Management Plan

Appendices

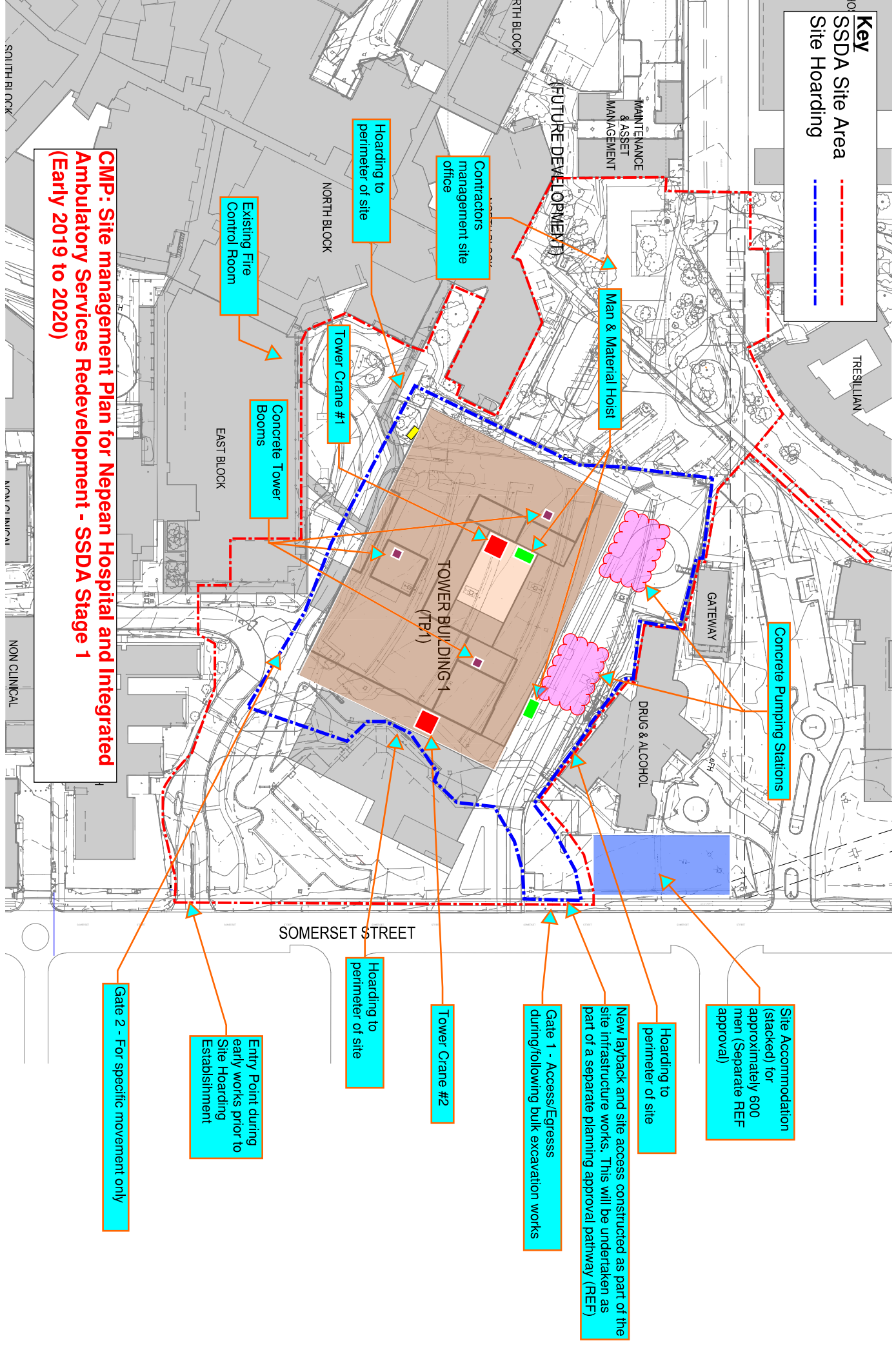
Appendix A: Draft Site Management Plan

1. Site Management Plan Stage 1 - Pre Childcare Demo
2. Site Management Plan Stage 1 - Post Childcare Demo

Key
 SSSDA Site Area
 Site Hoarding



CMP: Site management Plan for Nepean Hospital and Integrated Ambulatory Services Redevelopment - SSSDA Stage 1 (Early 2019 to 2020)



Site Accommodation (stacked) for approximately 600 men (Separate REF approval)

Hoarding to perimeter of site

New layback and site access constructed as part of the site infrastructure works. This will be undertaken as part of a separate planning approval pathway (REF)

Gate 1 - Access/Egresses during/following bulk excavation works

Tower Crane #2

Hoarding to perimeter of site

Entry Point during early works prior to Site Hoarding Establishment

Gate 2 - For specific movement only

Concrete Pumping Stations

Man & Material Hoist

Contractors management site office

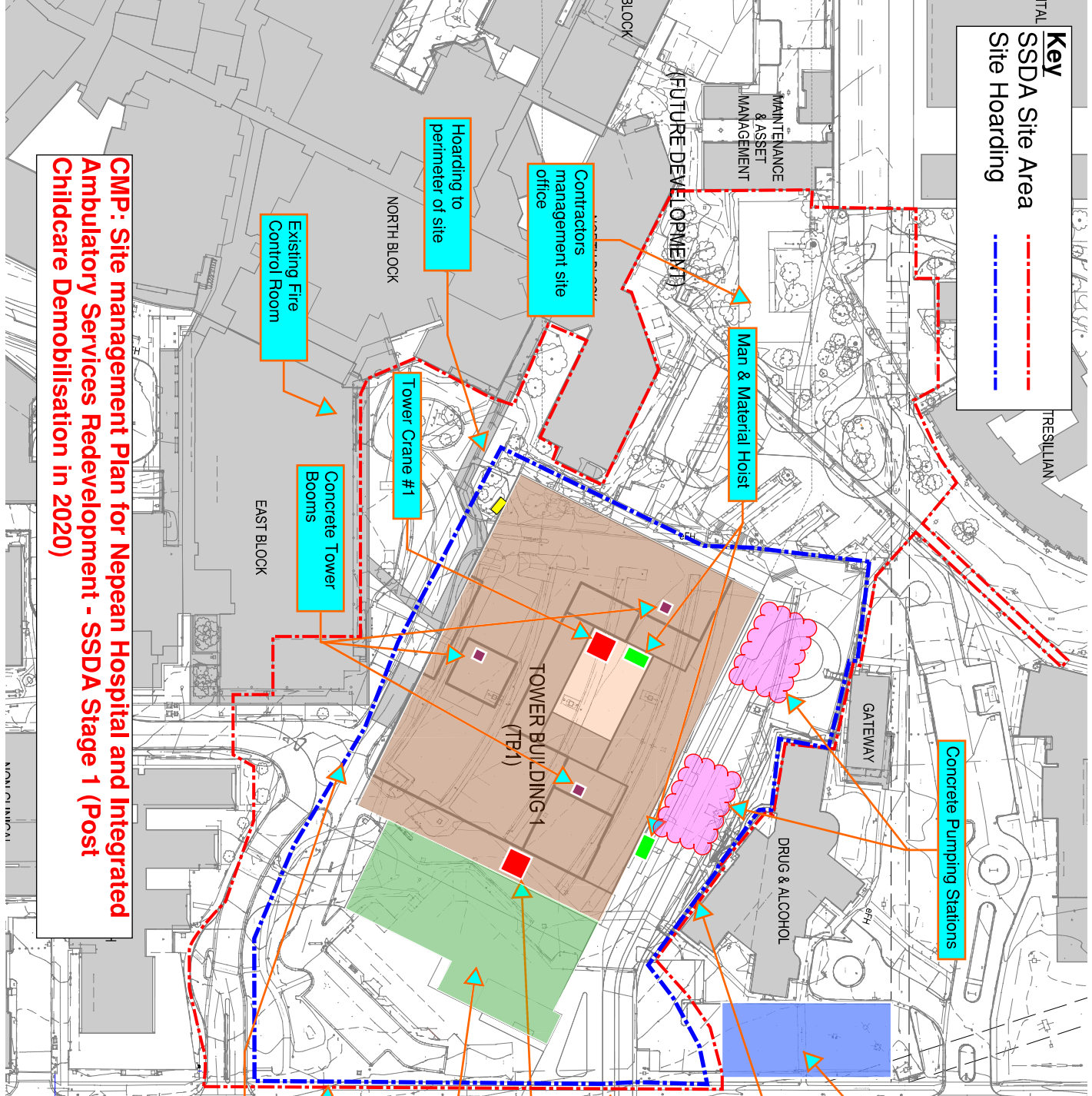
Hoarding to perimeter of site

Tower Crane #1

Concrete Tower Booms

Existing Fire Control Room

Key
 SSSDA Site Area
 Site Hoarding



CMP: Site management Plan for Nepean Hospital and Integrated Ambulatory Services Redevelopment - SSSDA Stage 1 (Post Childcare Demobilisation in 2020)

Concrete Pumping Stations

Site Accommodation (stacked) for approximately 600 men (Separate REF approval)

Hoarding to perimeter of site

Gate 1 - Access/Egress to be constructed following the demolition of the Childcare Centre. This will be the permanent access to the completed Stage 1 building

Tower Crane #2

Demolition of the Childcare Centre to be completed in early 2020. Ambulance bay construction to follow demo works.

Hoarding to perimeter of site

Gate 2 - For specific movements only

Man & Material Hoist

Contractors management site office

Hoarding to perimeter of site

NORTH BLOCK

Tower Crane #1

Concrete Tower Booms

EAST BLOCK

Existing Fire Control Room

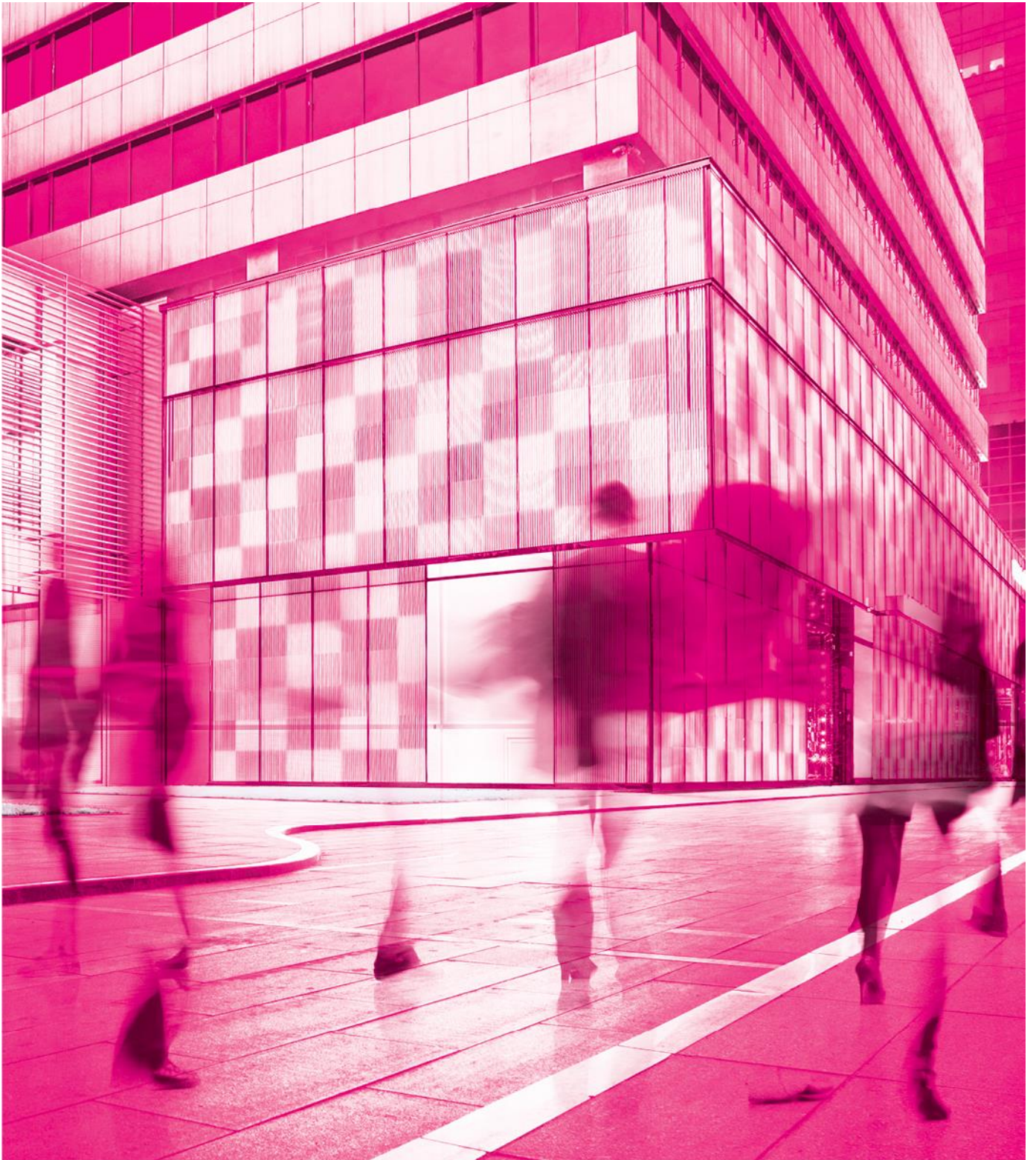
TOWER BUILDING 1 (TR1)

DRUG & ALCOHOL

GATEWAY

SOMERSET STREET

Appendix B: Construction Traffic Management Plan (CTMP)



CTMP;

**Nepean Hospital and Integrated
Ambulatory Services
Redevelopment - SSSA**

For Health Infrastructure

13 November 2018

**parking;
traffic;
civil design;
communication;**

ptc.

Document Control

Our Reference: T2-2271, Nepean Hospital and Integrated Ambulatory Services Redevelopment – Concept and Stage 1 SSDA, Construction Traffic Management Plan (CTMP)

Issue	Date	Issue Details	Author	Reviewed
1	14/12/17	Draft Issue	HL	AU
2	15/12/17	Final Issue	HL	AU
3	18/12/17	Final Issue (Revised)	HL	AU
4	06/04/18	Minor Edits	AM	AM
5	26/04/18	Final Issue (Revised)	HL	AU
6	20/07/18	Includes SEARs Table	AM	AM
7	06/11/18	Final Issue (Revised Section 7.6, Section 7.9 and Section 7.10)	KB	AU
8	09/11/18	Final Issue (Revised Section 5 and Section 7.15)	KB	AU
9	09/11/18	Final Issue (Revised construction staging plans and Section 7.15)	KB	AU
10	13/11/18	Final Issue (Revised Section 5.1 and Section 7.5)	KB	AU

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1. Executive Summary

This Construction Traffic Management Plan (CTMP) has been prepared to outline the construction traffic measures to improve site safety to the public and workers during the construction of the Stage 1 Building. It is envisaged that the demolition, excavation and construction stages are anticipated to have minimal impact on the larger surrounding traffic network. The following are key points highlighted in this report:

- All works associated with the project will be restricted to the proposed time periods outlined in Section 7.2;
- Commercial trucks up to 19m articulated vehicles (AVs) and 'truck and dogs' will be utilised to complete the demolition, excavation and construction stages;
- All construction vehicles accessing and departing the subject site will be constrained to the State and Regional road network wherever practicable;
- All construction vehicles will be required to enter and exit the hospital property in a forward movement and will be performing their turning movements within the hospital boundary.
- Due to the close proximity of train and bus services as well as site constraints, construction staff parking will not be provided on-site. The principal contractor will be encouraged to assist with the transportation of staff, and site personnel will be made aware of the available public transportation. Site personnel will also be encouraged to consider car-pooling.
- This report satisfies the following condition outlined within the Secretary's Environmental Assessment Requirements (SEARs) issued by the Department of Planning & Environment dated 20 November 2017:

Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and cumulative impact of nearby construction projects, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact.

It is noted that this report will be continually reviewed and amended if required due to changes in design and/or RMS, Penrith City Council or any other authority requirements.

2. Purpose of the Report

ptc. has been engaged by Health Infrastructure (HI) to prepare a parking demand and traffic assessment report to accompany a State Significant Development Application (SSDA) for the construction of a hospital expansion within the existing Nepean Hospital campus.

This report has been prepared in accordance with the traffic and transport related comments stated in Secretary’s Environmental Assessment Requirements (SEARs) dated 22 November 2017 relating to the SSDA.

The following table presents the SEARs relevant to Transport and Accessibility and confirms that each of these items has been addressed in this report.

SEARs	Comments and Reference
Item 5 – Transport and Accessibility	
<ul style="list-style-type: none"> • traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and the cumulative impact of nearby construction projects, including the preparation of a draft Construction Traffic Management Plan to demonstrate the proposed management of the impact. 	<p>The traffic movements and truck routes associated with the construction process are described in Section 6 of this document, which should be read in conjunction with the construction methodology statement prepared by CPB Contractors.</p>
Item 13 - Waste	
<ul style="list-style-type: none"> • Identify, quantify and classify the likely waste streams to be generated during construction and operation and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste. Identify appropriate servicing arrangements (including but not limited to, waste management, loading zones, mechanical plant) for the site. 	<p>The management of waste during the construction process is described in the construction methodology statement prepared by CPB Contractors.</p>

3. Introduction

3.1 Introduction

In particular, this CTMP refers to the Early Works involving the demolition of the existing car parking facilities, excavation, piling and in-ground works and the construction of the Stage 1 Building.

This CTMP has been prepared in response to the SEARs to address the traffic management arrangements during the construction works.

The location of the subject site is outlined in Figure 1.

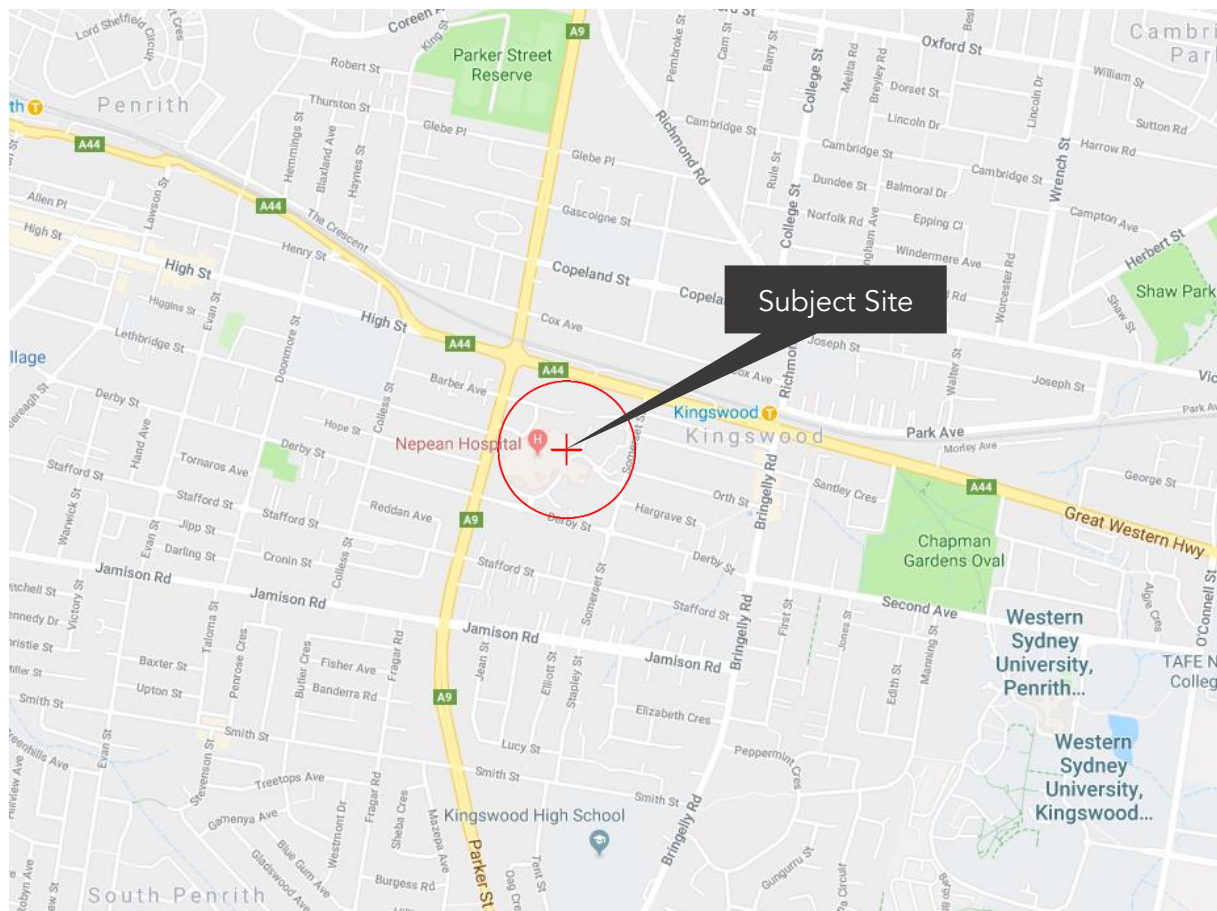


Figure 1 – Nepean Hospital Location (Source: Google Maps 2017)

3.2 Purpose of this Report

This report has been prepared to outline the traffic management arrangements associated with the Stage 1 Building, Nepean Hospital Redevelopment.

This report presents the following considerations in relation to the construction traffic management plan:

- Section 1 - Executive Summary;
- Section 2 - Introduction of the project;
- Section 3 - Background information, including a description of the site and current use;
- Section 4 - A description of the development proposal;
- Section 5 - A description of the road network serving the development site, the existing transportation options and active transport facilities;
- Section 6 - Management of construction vehicles and non-site traffic; and
- Section 7 - Summary.

3.3 Department of Planning & Environment Condition

In accordance with Item 5 outlined within the SEARs issued by the Department of Planning and Environment (DPE), this report addresses the issues outlined below:

Traffic and transport impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking and public transport and cumulative impact of nearby construction projects, including the preparation of a Construction Traffic Management Plan to demonstrate the proposed management of the impact.

4. Background

4.1 Site Context

The proposal relates to the following lot:

- Lot No. 1, DP1114090 (138,952m²).

The site is located in Kingswood, which is approximately 60 km west of the Sydney CBD. Within the suburb, the Nepean Hospital is located approximately 3 km to the east of the Penrith City Centre. The Penrith City Centre hosts a population of approximately 198,000 within the Penrith Local Government Area (LGA), which has experienced growth of approximately 11.9% between 2006 and 2015 according to ABS Census Data. It is expected that this growth continues in the future.

The hospital is bounded by the Great Western Highway to the north, Parker Street to the west, Derby Street to the south and Somerset Street to the east (see Figure 2).

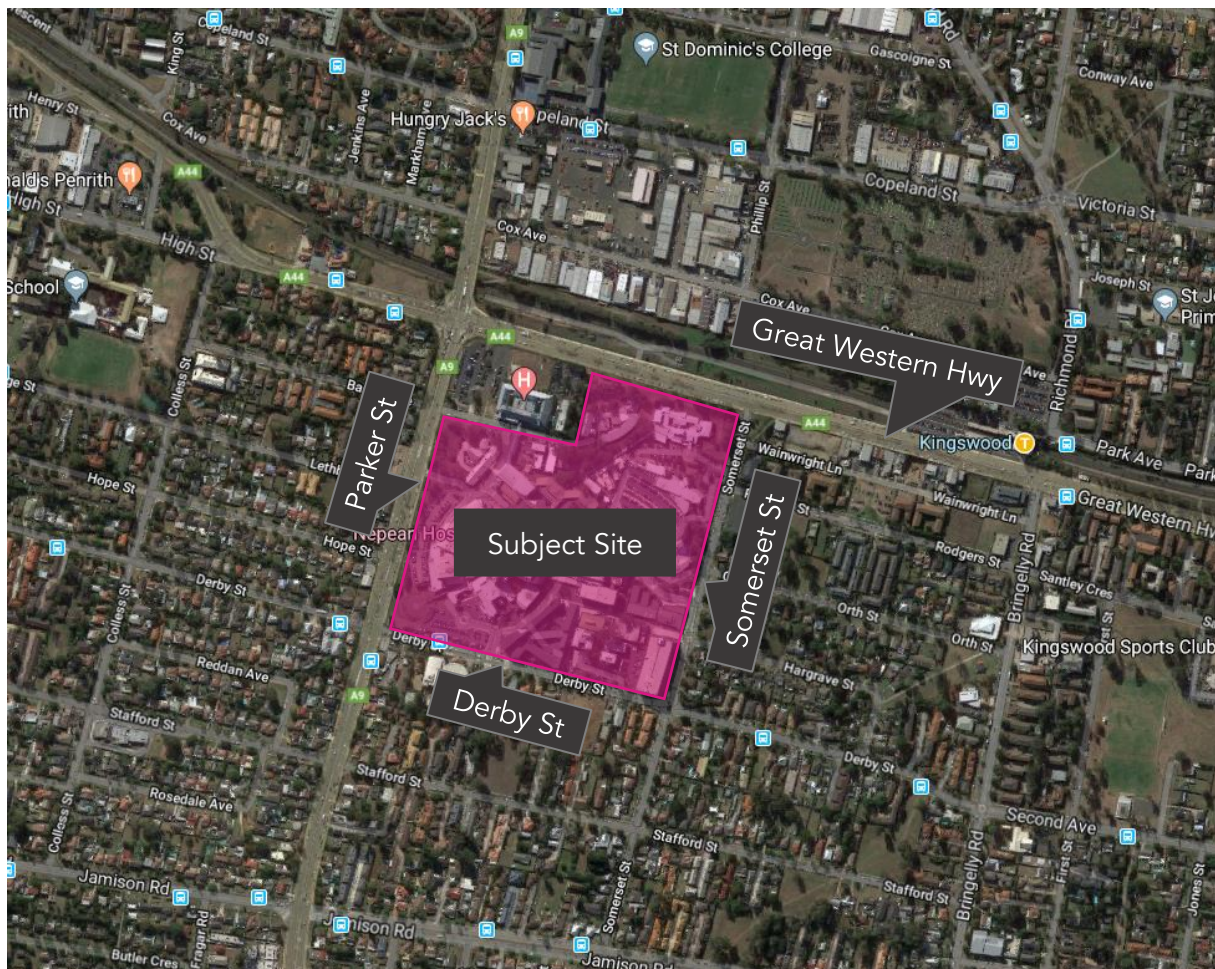


Figure 2 – Aerial View of the Nepean Hospital Campus (Source: Google Maps)

4.1.1 Existing Surrounding Land Use

In the context of the surrounding land use, the Hospital’s area is classified as an Infrastructure Zone (SP2) and is surrounded by a variety of different land uses:

- The west of the hospital is characterised by Medium (R3) and High (R4) Density Residential dwellings;
- Immediately to the east and south of the hospital is a Mixed Use (B4) area, followed by Medium (R3) and High (R4) Density Residential housings and the Chapman Gardens Oval, zoned as Public Recreation (R1);
- To the north-east of the Hospital lies a General Industrial (IN1) area, accommodating railway tracks, the Kingswood Railway station and several automotive outlets along the Great Western Highway. Behind these is the Kingswood Cemetery, zoned as Special Activities (SP1).

Figure 3 shows the surrounding land use.



Figure 3 – Surrounding Land Use (Source: NSW Planning Portal 2017)

4.1.2 Future Surrounding Land Use

In 2007, the NSW Department of Planning and Penrith City Council published the Penrith City Centre Plan, which outlines the foundation to ensure the rapid growth of the Western Sydney hub will be accommodated for within a 25-year period. The City Centre Plan aligns with the key objectives of the Council’s vision for Penrith to ensure growth into a “prosperous, vibrant and attractive city”.

The City Centre Plan identifies development opportunities in the context of the expected growth in population of 10,000 new residents and 10,000 new jobs within the City Centre.

The key initiatives identified within City Centre Plan include:

- Promoting office development in the commercial core;
- Promoting Government office accommodation options for the city centre;
- Investigating options for the development of the city park;
- Developing strategies to improve the educational facilities within the city centre; and
- Improving the accessibility within the city centre by investigating new transport options and planning for the necessary infrastructure.

In 2011, the Penrith Business Alliance (PBA) published the Penrith Health and Education Precinct Strategic Vision. The document aims to create local jobs by growing the skills base of the area as well as attract new investment to Penrith through the delivery of projects focused in four key areas:

- World leading health services;
- Education and training related to health and wellbeing;
- Research, in medicine and preventative health; and
- Business opportunities, related to health, medicine and wellbeing.

Consequently, the proposed Nepean Hospital Redevelopment is consistent with the objectives relevant to the Penrith Health and Education Precinct Strategic Vision, which will promote future government and non-government investment and development in the region's health sector.

4.2 Current Site Use

The Nepean Hospital is part of the Nepean Blue Mountains Local Health District, providing public health services to Greater Western Sydney. The area is served by a number of hospitals including Hawkesbury Hospital, Springwood Hospital, Blue Mountains Hospital and Lithgow Hospital.

The Hospital is the principal referral hospital and regional trauma centre for Western Sydney and provides a diverse range of services including emergency, intensive care, cancer care, cardiology, community health, drug & alcohol, medical imaging, mental health, sexual health, rehabilitation, pharma & allied health, and surgical services (including dental, neurosurgery, orthopaedic, plastic & reconstructive, thoracic, breast & endocrine, ENT, urology and vascular).

The Hospital also has an educational alliance with the University of Sydney. Medical, nursing and allied health students are placed at the hospital for practical terms.

The existing Hospital Campus map is presented in Figure 4.

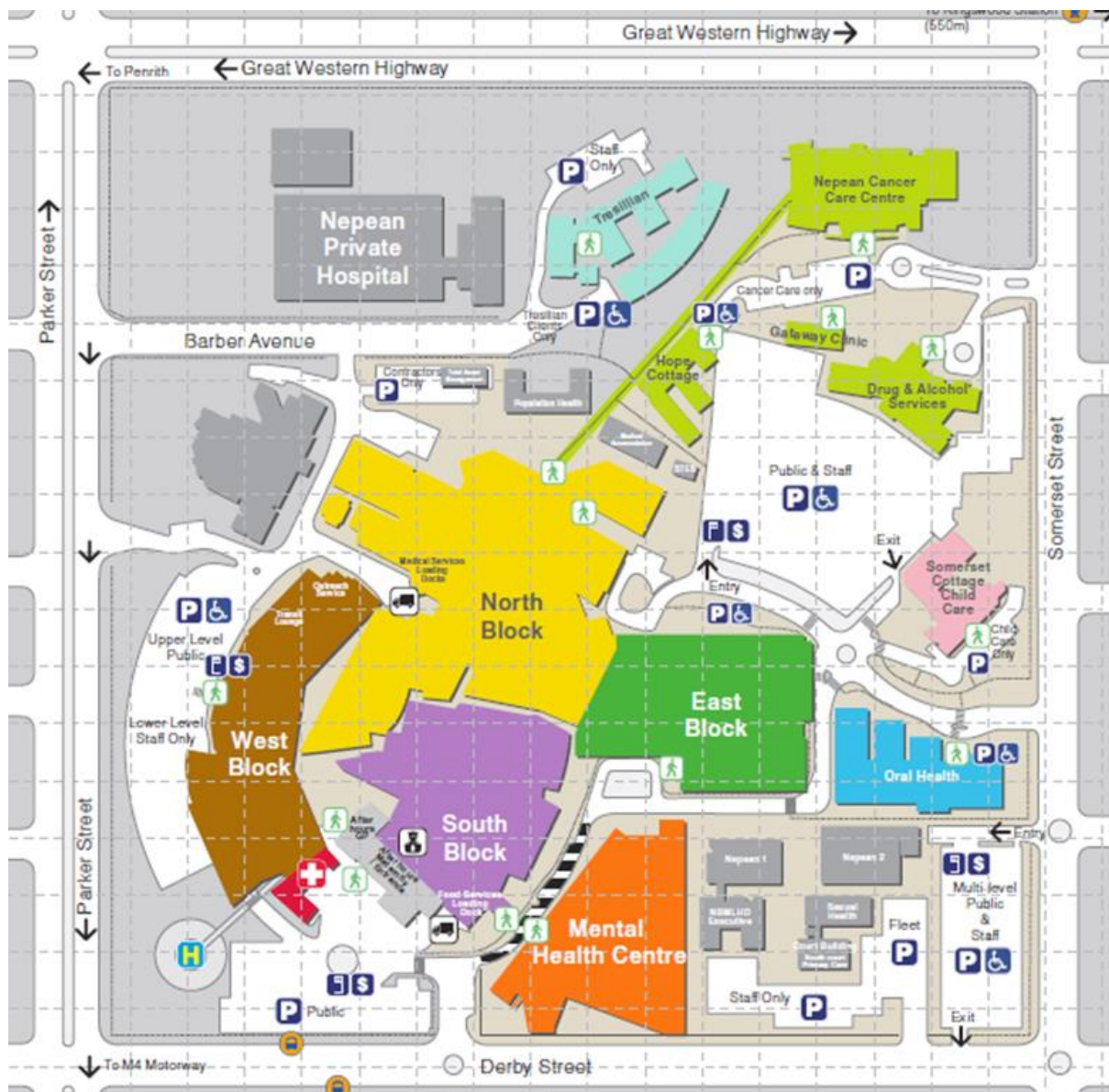


Figure 4 – Existing Nepean Hospital Campus Map (Source: NSW Health)

5. Development Proposal

Over the next 10 years, Nepean Hospital will undergo redevelopment to provide additional services to support the local and regional health demand requirements within Greater Western Sydney. The plans include the construction of the approved multi-deck car park (DA17/0665) and redevelopment of the hospital as per the new master plan prepared by BVN Architects for the horizon years 2021/22 & 2026/27.

The hospital redevelopment will enable the hospital to accommodate an additional 161,461 outpatient occasions of service per annum, 30,257 Emergency Department presentations per annum, over 200 inpatient beds and 1,115 students per annum by 2027.

5.1 Construction Staging

The proposed redevelopment involves the construction of an additional hospital building (the Stage 1 Building), and a separate project comprising an approved Multi-Deck Car Park (MDCP) with a capacity of 628 spaces and rooftop helipad (see Figure 5).

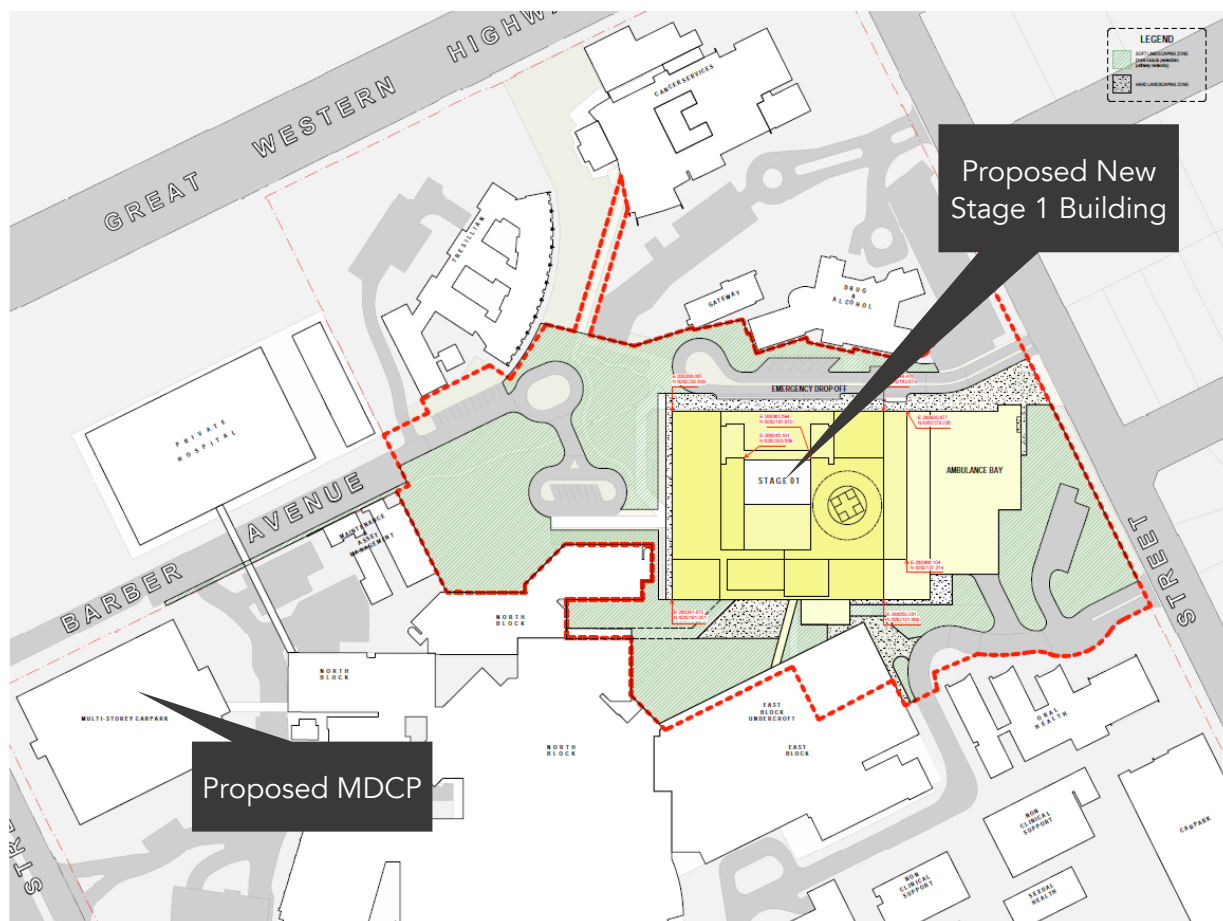


Figure 5 – Nepean Hospital Redevelopment Overview

It is anticipated that the construction of the MDCP is due to be completed by early 2019, whilst the construction of the Stage 1 Building is scheduled to be undertaken between early 2019 and late 2021. It is acknowledged that there is an overlap of the two construction activities; however, the construction of the MDCP will be nearing completion and operational, prior to the commencement of works for the Stage 1

Building. In light of this, only minor finishing works will be undertaken when the construction of the Stage 1 Building commences. Hence, a cumulative traffic impact assessment is not required.

The redevelopment works include the construction of 40 additional parking bays within the emergency vehicle areas and parking in the MDCP helipad area (addition of 108 car spaces) as well as an additional 20 spaces adjacent and to the north of new hospital building.

The construction program is divided into two key phases, as outlined below:

Table 1 - Construction Programme

	Time Period	Scope of Works
Phase I	January 2019 – May 2019	Demolition works including the mobilisation and clearing existing site, excavation, piling and in-ground works (construction of new temporary driveway and layback are to be completed under REF (Gate 1))
Phase II	June 2019 – September 2021	Construction of the Stage 1 Building

Figure 6 presents the site establishment plan. A temporary vehicular driveway (Gate 1) will be constructed under a REF to allow construction vehicle access and egress to the site. No access to site will be required for the campus wide infrastructure works. This to be conducted under a separate planning approval pathway. The location of this driveway has shifted north due to the Childcare Playground remaining until early 2020.



Figure 6 - Site Establishment Plan (Phase I - Site Boundary Zone 1)

6. Existing Transportation Facilities

6.1 Road Hierarchy

The Hospital is served by a regional and local road network, which provides ready access to the City Centre and the surrounding region, while the Great Western Highway and Parker Street provide the primary connection to the Sydney CBD. The road network in this area is also comprised of State and Regional roads, as well as local roads providing access to the surrounding land uses.

The surrounding road network is illustrated in Figure 7.

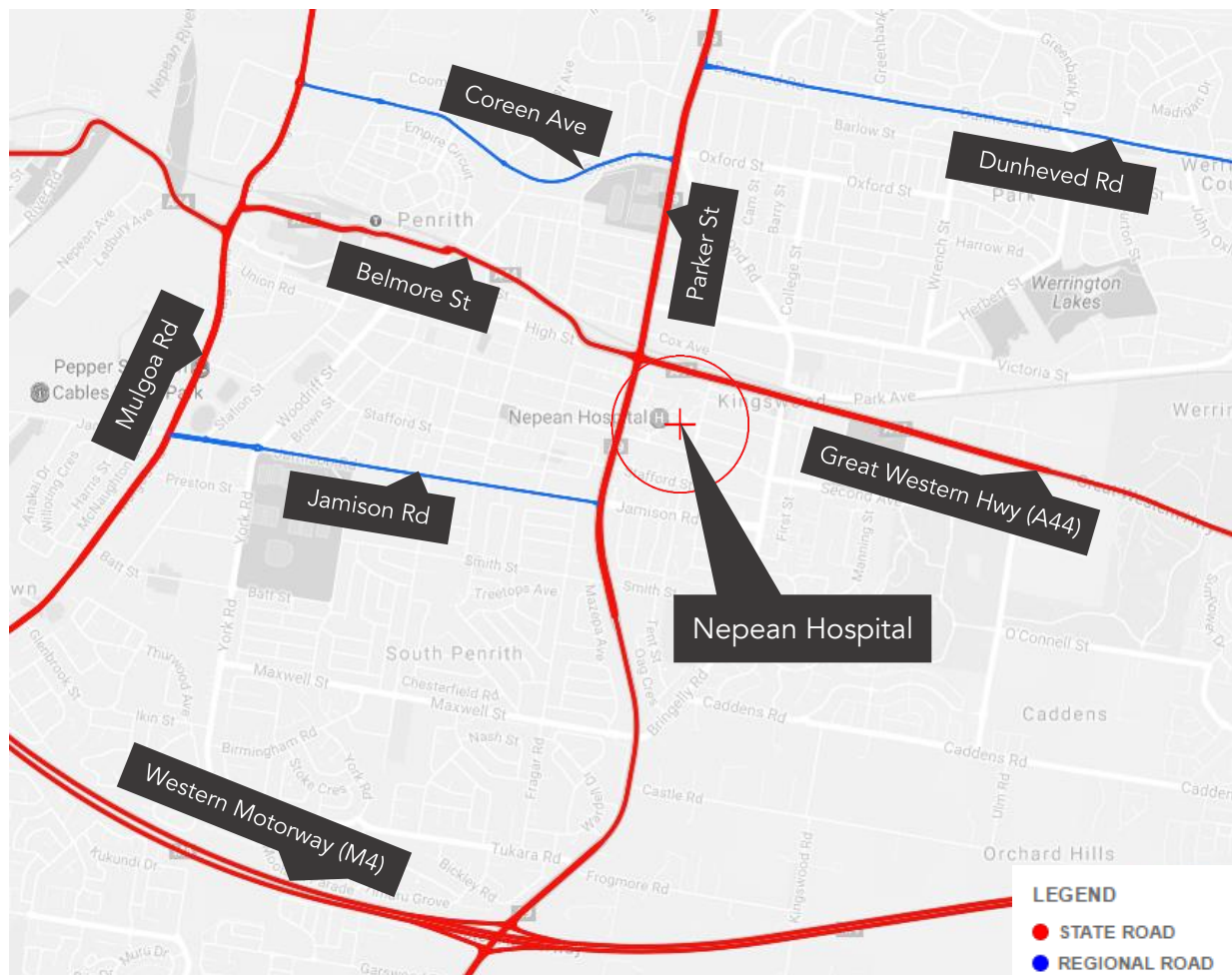


Figure 7 – Road Hierarchy (Source: RMS Road Hierarchy Review)

The NSW administrative road hierarchy comprises the following road classifications, which align with the generic road hierarchy as follows:

- State Roads: Freeways and Primary Arterials (RMS Managed)
- Regional Roads: Secondary or sub-arterials (Council Managed, Part funded by the State)
- Local Roads: Collector and local access roads (Council Managed)

The road network serving the site includes:

Great Western Highway	
Road Classification	State Road
Alignment	East – West
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	22.5 metres
Speed Limit	60kph
School Zone	No
Parking Controls	Eastbound: unrestricted parking on the outer most lane; Westbound: partially unrestricted parking on the outer most lane, partially 'No Stopping'
Forms Site Frontage	Yes



Figure 8 – Streetview of Great Western Highway, Eastbound (Source: Google)

Parker Street	
Road Classification	State Road
Alignment	North – South
Number of Lanes	3 lanes in each direction
Carriageway Type	Divided
Carriageway Width	22.5 metres
Speed Limit	70kph
School Zone	No
Parking Controls	Southbound: unrestricted parking on the outer most lane; Northbound: partially unrestricted parking on the outer most lane, partially 'No Stopping'.
Forms Site Frontage	Yes

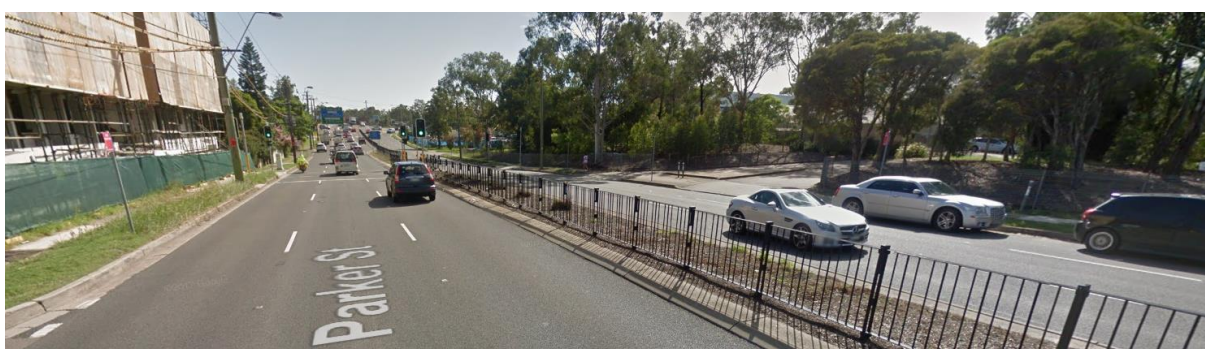


Figure 9 – Streetview of Parker Street, Northbound (Source: Google)

Derby Street	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Un-divided
Carriageway Width	12 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Eastbound: partially 'No Stopping' and 'Bus Zone' areas, partially free 2 hour parking; Westbound: partially 'Bus Zone' and free 15 min parking, partially free 4 hour parking.
Forms Site Frontage	Yes



Figure 10 – Streetview of Dorby Street, Eastbound (Source: Google)

Somerset Street	
Road Classification	Local Road
Alignment	North – South
Number of Lanes	1 lane in each direction
Carriageway Type	Un-divided
Carriageway Width	12 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Free 2 hour parking northbound and 4 hour parking southbound
Forms Site Frontage	Yes



Figure 11 – Streetview of Somerset Street, Northbound (Source: Google)

Barber Avenue	
Road Classification	Local Road
Alignment	East – West
Number of Lanes	1 lane in each direction
Carriageway Type	Un-Divided
Carriageway Width	9 metres
Speed Limit	50kph
School Zone	No
Parking Controls	Free 2 hour parking on the southern road side, 'No Stopping' on the northern road side
Forms Site Frontage	Yes



Figure 12 – Streetview of Barber Avenue, Eastbound (Source: Google)

6.2 Key Intersections

A number of key intersections have been identified in the vicinity of the development site (see Figure 13). These are listed below, together with their characteristics:

1. Great Western Hwy / Parker St – Four arm signalised intersection;
2. Western Motorway / The Northern Road – Four arm signalised intersection;
3. Great Western Hwy / Somerset St – Non-signalised T-intersection;
4. Jamison Rd / Somerset St - Non-signalised T-intersection;
5. Jamison Rd / Bringelly Rd - Non-signalised T-intersection;
6. Great Western Hwy / Bringelly Rd – Signalised T-intersection;

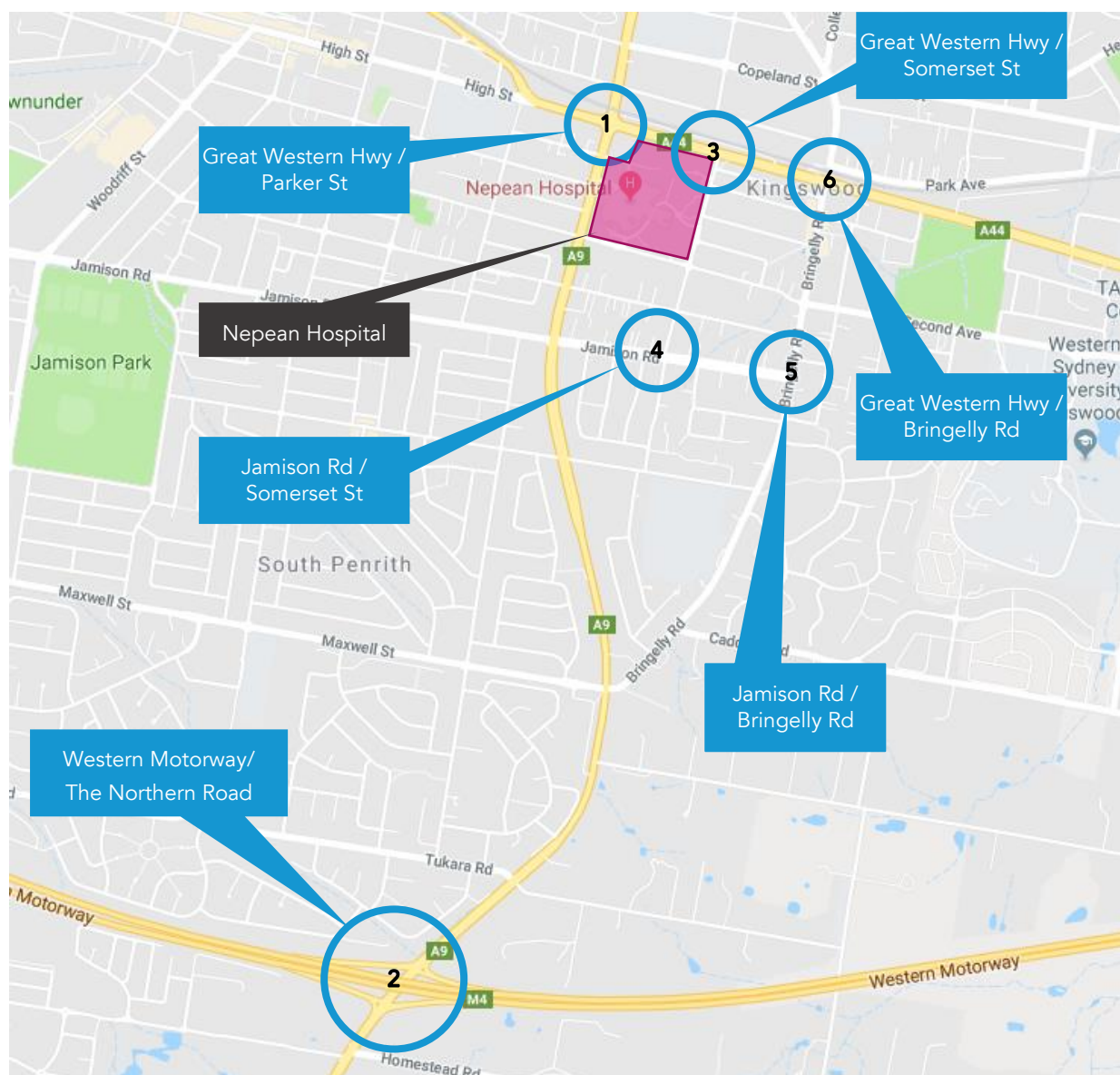


Figure 13 - Key Intersections

6.3 Traffic Crash Data

The Centre for Road Safety, within Transport for NSW (TfNSW), has provided historical crash data for the five-year period between 2011 and 2015 of crashes within the vicinity of the Hospital, as shown in Figure 14.

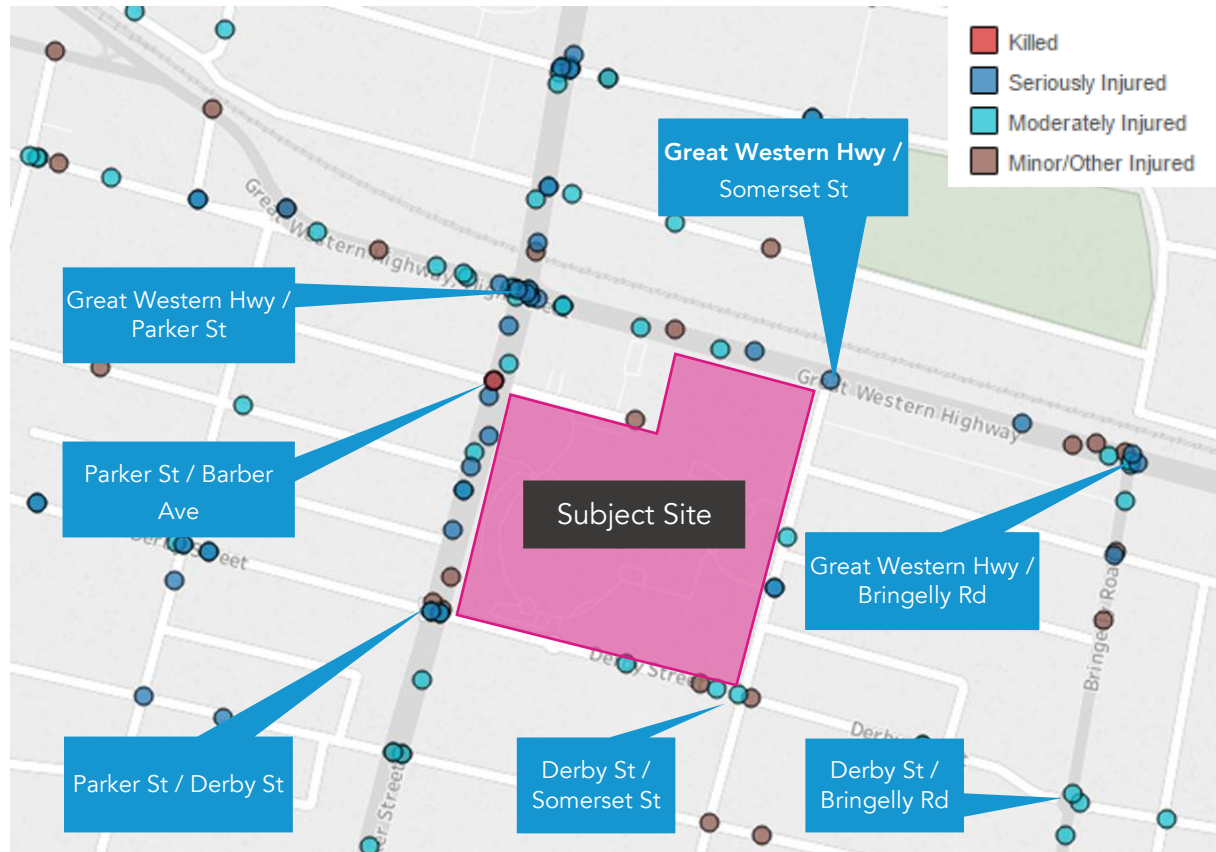


Figure 14 – Crash Data from 2011-2015 (Source: Centre for Road Safety - TfNSW, 2016)

6.4 Public Transport

A number of public transport options are available in the vicinity of the site in the form of buses and rail. The NSW Planning Guidelines for Walking and Cycling 2004 (the Guide) suggests a distance of 400m as a walkable catchment to access local amenities. The Guide also recommends that an 800m catchment is an acceptable, walkable distance if the development is within an area with public transport links. Furthermore, the document also suggests a distance of 1500m is a suitable catchment for cycling for accessibility to public transport facilities and local amenities.

6.4.1 Rail

The closest station, Kingswood Railway Station, is located approximately 600m (walking distance) from the site, which is considered to be within reasonable walking distance.

The station is on the T1 Western Line, from Emu Plains and Richmond to the City. Services operate every 5 – 15 minutes during peak hours, with services operating from 3.16am to 11.36pm.

The distance from the Hospital, the availability of taxi links from the station to the Hospital as well as the relative frequency of services could make heavy rail an attractive mode share option for construction workers.

6.4.2 Bus Services (Private and Public)

The Hospital Precinct is serviced by the bus routes presented in Table 2. There are two bus stops located on the southern boundary of the Hospital Precinct and two bus stops on Great Western Hwy, as indicated in Figure 15.

Table 2 – Bus Service Summary

Route No.	Coverage	Frequency
677	Richmond to Penrith	Weekdays: Services every 60 minutes in the morning peak and 2 services in the evening peak Weekends: 2 services, at 9:31am and 5:14pm
774	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 6:25am and 11:36pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
775	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:21am and 10:56pm Weekends: Services every 1 hour, between 7:33am and 10:20pm
776	Mount Druitt to Penrith	Weekdays: Services every 30 minutes, between 5:36am and 10:20pm Weekends: Services every 1 hour, between 8:14am and 11:03pm
780	Mount Druitt to Penrith	Weekdays: Services every 15-30 minutes, between 5:18am and 10:10pm Weekends: Services every 30-60 minutes, between 6:31am and 9:31pm
789	Luddenham to Penrith	Weekdays: 2 services every weekday, at 7:54am and 4:30pm Weekends: No services

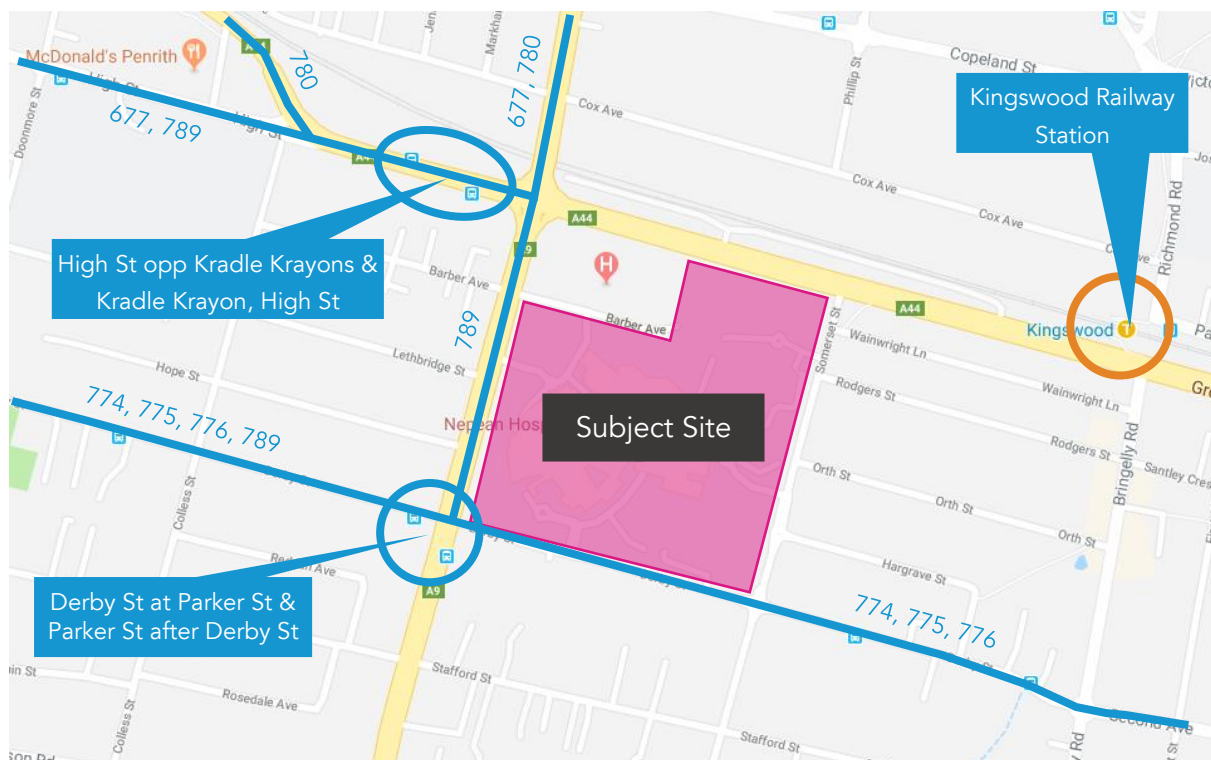


Figure 15 – Local Bus Services Map

The Hospital is relatively well serviced by bus, with a number of routes and regular services (every 30 mins on weekdays), and therefore provides an alternative mode share option for some construction workers, subject to the availability of convenient bus stops close to their home location.

6.5 Active Transport

In addition to public transport, the locality has also been assessed for its active transport potential.

6.5.1 Bicycle Network

It is noted that the cycling infrastructure in the Penrith region is relatively underdeveloped, with no dedicated bicycle paths in the vicinity of the Hospital. As such, cycling is not expected to be an attractive method of travel for construction staff.

6.5.2 Pedestrian Facilities

The pedestrian infrastructure is well developed in the vicinity of the hospital, with footpaths on both sides of the surrounding roads, signalised pedestrian crossings, zebra crossings, appropriate signage and markings. In addition to this, the topography of the area is relatively flat. However, as with cycling, walking is only likely to be an attractive option for workers who live relatively close to the Hospital.

The campus is surrounded by a reasonable volume of low-density residential developments, apart from the area to the north of the Great Western Highway, which are predominantly light industrial and bulky goods.

7. Traffic Management Plan

7.1 Objective

The traffic management plan associated with the construction activity aims to ensure the safety of all workers and road users within the vicinity of the construction site and the following are the primary objectives:

- To minimise the impact of the construction vehicle traffic on the overall operation of the road network;
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers;
- Installation of appropriate advance warning signs to inform users of the changed traffic conditions;
- To provide a description of the construction vehicles and the volume of these construction vehicles accessing the construction site;
- To provide information regarding the changed access arrangement and also a description of the proposed external routes for vehicles including the construction vehicles accessing the site; and
- Establishment of a safe pedestrian environment in the vicinity of the site.

7.2 Hours of Work

All works, associated with the project will be restricted to the following proposed working hours associated with the construction activity:

- Monday to Friday 07:00am to 06:00pm;
- Saturdays 07:00am to 05:00pm¹;
- Sunday or public holidays No works to be undertaken

7.3 General Requirements

All construction activities shall be wholly contained within the approved construction compounds, including, but not limited to plant, vehicles, materials, waste, site offices and amenities.

Any hoardings and barriers shall not impact pedestrians, maintaining worksite security, whilst providing appropriate pedestrian thoroughfare. Providing safe pedestrian visibility near any crossing points will be key criteria in the hoarding arrangements. Prior to any site establishment works, the hoarding arrangement will obtain approval from the relevant Certifying Authority. Upon completion of any stage, the dismantling of any hoardings or road-signage shall be done in accordance with RMS Traffic Control at Works Sites Manual.

In accordance with Road and Maritime Services (RMS) requirements, all vehicles transporting loose materials will have the entire load covered and/or secured to prevent any large items, excess dust or dirt particles depositing onto the roadway during travel to and from the site. All subcontractors must be inducted by the lead contractor to ensure that the procedures are met for all vehicles entering and exiting the construction site. The lead contractors will monitor the roads leading to and from the site and take all necessary steps to rectify any road deposits caused by site vehicles.

¹ Justification of the hours for Saturday is provided within the Construction Management Plan

Vehicles operating to, from and within the site shall do so in a manner, which does not create unreasonable or unnecessary noise or vibration. No tracked vehicles will be permitted or required on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

7.4 Construction Vehicle Types

As stated previously, the development involves the demolition of the existing public and staff car park, the excavation of the site and the construction of the Stage 1 Building, which will require removal and delivery of mixed materials. This will involve the use of commercial trucks up to 19m 'truck and dogs' and 19m articulated vehicles (AVs).

Any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to, and subsequent approval by the relevant authority prior to any delivery. It is also anticipated that some special oversize vehicles will be required, such as a crane. These vehicles will be subject to an access permit application to the National Heavy Vehicle Regulator (NHVR).

All construction vehicles are to enter and exit the site in a forward movement.

7.5 Construction Vehicle Routes

The site is located in Kingswood and the proposed construction vehicle routes have regard for the surrounding traffic arrangements within the vicinity of the site.

The proposed construction vehicle routes are outlined in Figure 16. These routes shall be communicated to construction staff during the induction process. As a general requirement however, all drivers and associated companies are responsible for adhering to the road rules and regulations.

As stated previously, a temporary layback is proposed within the Somerset Street frontage to allow construction vehicular access into the site. This work will be completed under a REF.

Construction vehicle access will be limited to the State and Regional road network wherever practicable to minimise the impact on the surrounding road network.

Construction vehicles travelling to the site from the north are able to travel southbound along Parker Street, turn east onto the Great Western Highway then proceed south along Somerset Street towards the site. Vehicles travelling from the east and west are able to utilise the Western Motorway, turn north onto The Northern Road, turn east onto the Great Western Highway and proceed south onto Somerset Street to Gate 1. Similarly, vehicles from the south are able to follow the route outlined previously to access the site.

For egress routes, vehicles travelling towards the east will be required to travel south along Somerset Street, turn east onto Jamison Road, north along Bringelly Road towards the signalised intersection and east onto the Great Western Highway. Construction vehicles travelling towards the north, south or west will need to travel north along Somerset Street, east along the Great Western Highway towards the destination.

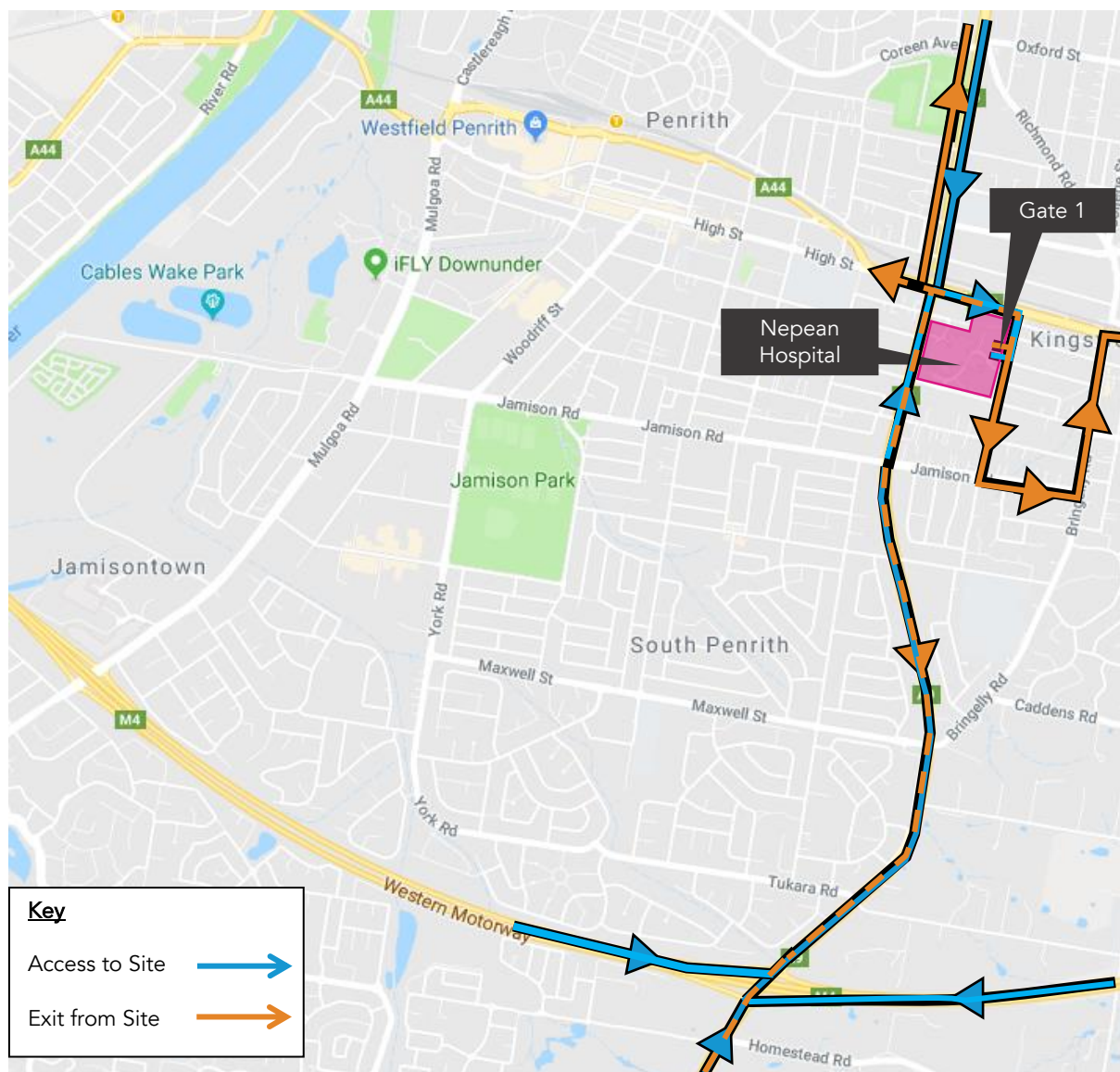


Figure 16 – Proposed Construction Vehicle Routes during Stage 1 Early Works

7.6 Construction Impacts & Stakeholders

7.6.1 Construction Activity

ptc. has been advised by CPB that on average, it is estimated that there will be approximately 350 construction workers on site with up to 500 workers during the peak construction phases.

Based upon calculations prepared by CPB, it is estimated that the truck movements associated with bulk excavation deliveries will involve up to 75 trucks per day. It is noted that bulk excavation is scheduled to occur for a duration of 18 days in total. In light of this information, it is estimated that there will be approximately eight heavy vehicle movements during the peak hour, assuming 10% of truck movements occurring during the peak.

As there is limited parking available within the vicinity of the site and due to the lack of parking for construction staff, driving to the site is not considered an attractive mode of travel for workers. As such, it is not anticipated that there will be a significant traffic impact in regard to light vehicles.

Given the close proximity of the State and Regional road network to the hospital, it is anticipated that the increase in traffic volumes will be within tolerance of the local road network.

7.6.2 Impacts on Road Network

It is considered that in general, construction impacts will be limited as all routes have been adopted to minimise use of local roads, limiting as far as is practicable, interfacing between heavy vehicles and other road users.

In light of the above, although the volume of light and heavy vehicles will increase within the immediate road network, these increases are not expected to create any major traffic-related impacts to the road users and local population around the site.

7.6.3 Impacts on Pedestrians and Cyclists

Site fencing will be established to prohibit any pedestrian accessing into the site. A Traffic Control Plan (TCP) will be prepared by the construction contractor outlining the vehicular access points and traffic controller locations to minimise any risk to the pedestrians on the footpath. The TCP will be submitted to Council in due course.

As stated in Section 6.5.1, there are no dedicated bicycle paths at the vicinity of the site, hence no impact on the cyclists is expected.

7.6.4 Impact on the Bus Network

As shown in Figure 15, the existing bus stops are located away from the construction site access. Therefore no impact on the bus network is expected.

7.6.5 Stakeholders

Stakeholders should be identified, and informed of the proposed works, potential timing, and possible impacts. These details will be better understood upon further development progression. Some of the initial stakeholders are listed in the following section.

- Health Infrastructure (Proponent);
- Department of Planning & Environment (Approval Authority);
- Penrith City Council;
- Roads & Maritime Services (RMS);
- State Transit Authority (STA);
- Local Employees and Residents;

7.7 Traffic Control Measures

Traffic Control Plans (TCP) will be developed in due course; TCPs shall be developed in accordance with the Australian Standards and the RMS Traffic Control at Works Sites Guidelines.

Any traffic controllers engaged on-site shall be accredited by RMS, and act in accordance with RMS Standard Conditions, including:

- No stopping of traffic on public streets; and
- No stopping of pedestrians in anticipation of truck movements. Pedestrians may only be held for short periods, for their safety, whilst a truck is entering or leaving the site.

No marshalling or queuing of trucks shall be permitted on the public road.

7.8 Pedestrian Access

To provide segregation and protection for pedestrians, temporary fencing is to be established to define the extents of the works site.

All access points are to be securely locked when construction activities are not in progress.

7.9 Works Zone

A Works Zone is proposed within the Somerset Street frontage extending along the extent of the property. Neither Great Western Highway nor Parker Street will be affected by the works zone.

A separate application will be submitted to the relevant consent authority in due course. The application shall include a Dilapidation Report and a Traffic Control Plan (TCP), in accordance with application requirements.

7.10 Road Occupancies

There is no requirement for any demolition and construction vehicles to stop before entering the site. The vehicles will be contained wholly within the construction site or the works zone.

No lane or road closures are proposed at this stage, as well as no impact on either Great Western Highway or Parker Street from the development is expected. In the event that works do require a lane or road closure or the works will impact on either Great Western Highway or Parker Street, the proponent shall submit a Road Occupancy Licence (ROL) application to the Transport Management Centre (TMC) for approval, prior to carrying out the associated works. The proponent recognises that a minimum of 10 days is required for the assessment of an ROL and will manage this accordingly.

7.11 Special Deliveries

Whilst not anticipated, any oversized vehicle that is required to travel to the site will be dealt with separately, with the submission of required permits to and subsequent approval by the relevant consent authority prior to any delivery.

7.12 Staff Parking

Due to site constraints and the very close proximity of a number of regular bus services, parking will not be provided on-site. To minimise car usage, the contractor will be encouraged to assist in the transportation of workers to the site and all site personnel will be made aware of the public transport options available in the vicinity of the site (refer to Section 6.4) and encouraged to utilise these facilities. Site personnel will also be encouraged to consider car-pooling where ever practicable. Staff related with the construction works should not park on the public road.

7.13 Work Site Security

To provide security to the works site and protection to the general public, the construction site is to be secured via the use of temporary fencing (e.g. construction site fencing with shade cloth), which will define the extent of the works site. All access points are to be securely locked when construction activities are not in progress.

7.14 Construction Staff Induction

All construction staff and subcontractors engaged on site will be required to undergo a site induction. The induction will include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, WH&S, driver protocols and emergency procedures. Additionally, the lead contractor will discuss CTMP requirements regularly as part of a toolbox talks and advise workers of public transport and car-pooling opportunities.

7.15 Emergency Vehicle Access

A new laydown area will be provided to accommodate up to two emergency fire vehicles, see Figure 17. The location is outside the construction area, allowing for unrestricted access through the local roads.

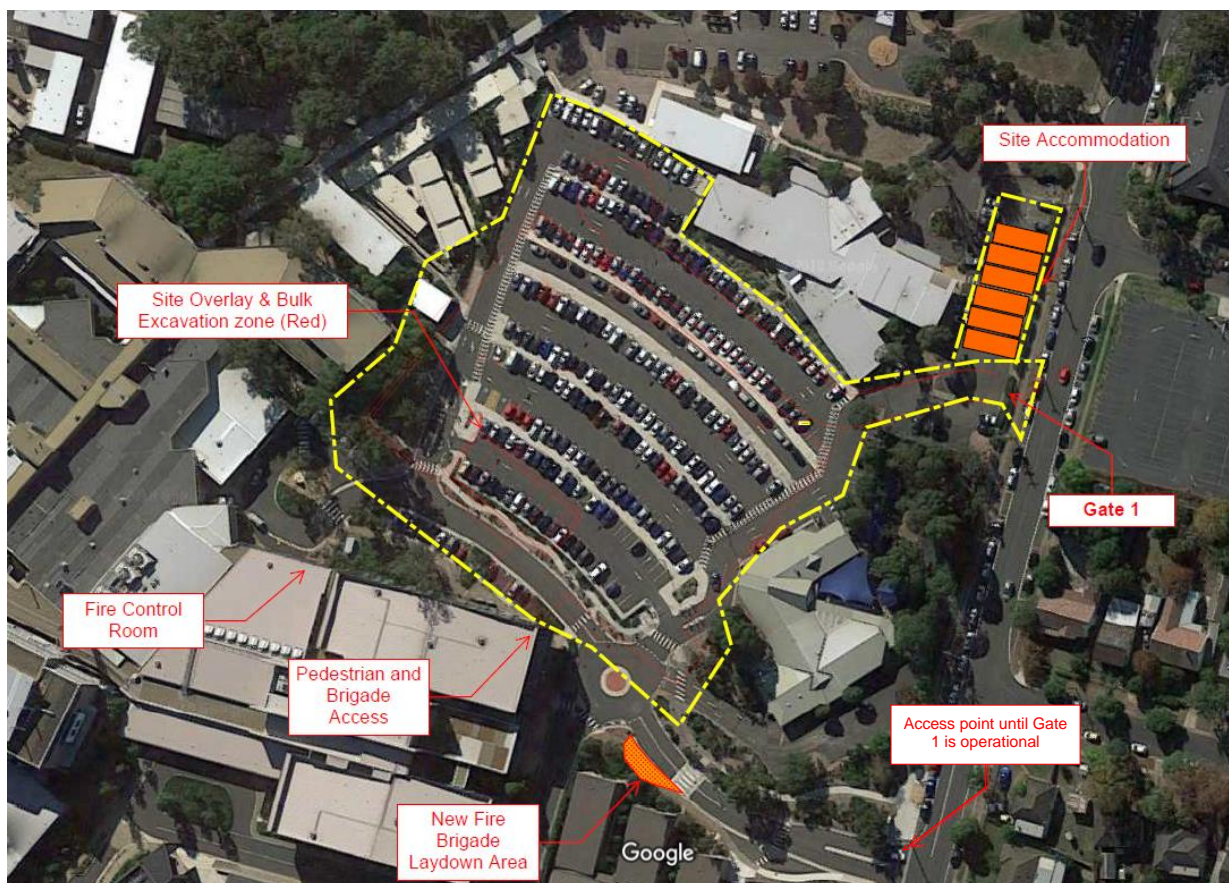


Figure 17 – Proposed Site Establishment Plan

Emergency vehicles will always be given priority during operation hours. Outside of operation hours, on-site staff will be present and will be able to provide access to emergency vehicles, if required.

7.16 Access to adjoining properties

Access to all adjoining properties is to be maintained throughout the works.

7.17 Work Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold RMS accreditation in accordance with Section 8 of Traffic Control at Worksites.

7.18 Contact Details for On-Site Enquiries and Site Access

Contact details for on-site enquiries and site access will be provided in due course, prior to the mobilisation of the contractor.

8. Summary

This CTMP has been prepared to outline the construction traffic measures to improve site safety to the public and workers and the construction process. In light of our assessment, it is not anticipated that the construction activity will have a significant impact on the local road network.

It is envisaged that this document will be continually reviewed and amended if required, due to changes in design, or additional requirements of DPE, Council, RMS or any other authority requirements.

Appendix C: Waste Management Plan

Waste Management Plan

Nepean Hospital and Integrated Ambulatory Services Redevelopment – Stage 1

Project number:	N1038
Document number:	NHR-CPB-MPL-QLT-TB1-ALL-0000101
Revision date:	14/11/2018
Revision:	01

Document Approval

Rev.	Date	Prepared by	Reviewed by	Approved by	Remarks
A	18/12/17	C. Billinghamurst	Raz Favotto		
Signature:					
B	06/04/18	C. Billinghamurst	Raz Favotto		
Signature:					
C	21/07/18	C. Billinghamurst	Steve Garzo		
Signature:					
00	14/11/18	Max Elmes	Nick Carnevale	Steve Garzo	
Signature:		ME	NC	SG	

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Details of Revision Amendments

Document Control

The Project Manager is responsible for ensuring that this plan is reviewed and approved. The Project Environmental Manager is responsible for updating this plan to reflect changes to environmental, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the Project Manager and/or client before being distributed / implemented.

Revision Details

Revision	Details
A	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – Concept and Stage 1 SSDA
B	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA
C	Issued for Nepean Hospital and Integrated Ambulatory Services Redevelopment – SSDA. SEARs Table added with Cross References.
01	Updated to include response to submission comments and updated staging details.

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Part A: Overview

1. Structure of this Plan

This Waste Management Plan (WMP) is a sub plan to the Environmental Management Plan and outlines how we will achieve acceptable Waste Management & associated environmental outcomes on the Nepean Blue Mountains Local Health District Nepean Hospital, for the demolition of the existing on grade public & staff carpark and during the early works, excavation, piling and installation of in ground services and the by the application of the CPB Contractors Environmental Management System (EMS).

In addition to the Project Management Plan, other Project Plans that interface with the Environmental Management Plan include:

- Construction Management Plan
- Engineering and Design Management Plan
- Quality Management Plan
- Safety and Health Management Plan
- Completion Management Plan

The plan has the following structure:

Part A: Overview	<p>This section clearly defines:</p> <ul style="list-style-type: none">■ Purpose and Scope of the WMP■ Project Description■ Waste Management Contract Requirements■ Objectives and Targets■ Key Waste Stakeholders
Part B: Waste Management Plan	<ul style="list-style-type: none">■ Scope■ Project Compliance Requirements■ Waste Management Streams■ Objectives and Targets■ Controls Used to Manage Waste■ Waste Management Licenses■ Monitoring
Appendices	<p>This section provides information supporting the WMP including:</p> <ul style="list-style-type: none">■ Waste Management Plan Schedule Summary of estimated Waste generated and how it will be re-used, recycled or sent to land fill.

2. Project Overview

2.1 Purpose and Scope

CPB Contractors has been contracted by Health Infrastructure NSW to provide a Waste Management plan for the **Nepean Hospital and Integrated Ambulatory Services Redevelopment - SSDA**.

This Plan is established in accordance with 'The Way We Operate' framework and is the key sub plan to our Environmental Management Plan that integrates Waste requirements and client waste requirements during project delivery.

Implementation of the Waste Management Plan will:

- Identify the waste management obligations attached to the tender / project and the hazards and risks associated with the works
- Assist in the prevention of unauthorised environmental harm
- Fulfil the Client's waste management requirements as defined in the Contract, including complying with relevant permits and approvals
- Comply with all relevant waste management and environmental legislation
- Minimise negative impacts on the community that relate to the Project's waste management and associated environmental impacts
- Identify and implement feasible opportunities to reduce and recycle waste to minimize the impact of the Project to the environment.to meet compliance requirements
- Fulfil CPB Contractors' waste management and environmental requirements enabling continued certification to ISO14001 and contribution to CPB Contractors' overall Business Plans.

The Project Manager, with advice and input from senior construction staff, is responsible for the Plan.

2.2 Project Description

The works covered within this Waste Management Plan includes the demolition of the existing on grade public and staff car park to make the land vacant to enable the commencement of the early construction works associated with the new Stage 1 Building works.

Demolition will include removal of the bitumen on grade carpark including concrete kerbs, gutters and footpaths and some vegetation to clear the site in preparation for the commencement of the excavation, associated piling works and services diversions

Demolition of the existing Childcare Centre and associated structures will be undertaken after the building structure commences. This is programmed for early 2020.

During excavation there will be some demolition works associated with existing redundant storm water services and other services as required.

The Early works package of work consists of the following:

- Site Mobilisation (completed under separate ref approval)
- Construction of new driveway layback within Somerset Street frontage - Gate 1 for site access/ egress. (Completed under separate REF approval)
- Clearing existing Site (Including kerbs, shrubs lighting, poles etc) within the footprint of the New Hospital Tower)
- Demolition of on grade carpark
- Diversion of services around site as required (Completed under separate REF approval)
- Excavation
- Piling
- In ground works

2.3 Waste Management Contract Requirements

The following table sets out the minimum client requirements as defined in draft Contract HI17167 of the Preliminaries for the General Conditions (Main Works GC21 e2) as addressed within this Plan.

Table 1: **Draft** Contract Requirements for Environmental Management

Contract Reference	Content requirements	Where addressed	Comments
GC21 Preliminaries – 6.3	<p>Implement waste minimisation and management measures, including:</p> <ul style="list-style-type: none"> • recycling and diverting from landfill surplus soil, rock, and other excavated or demolition materials, wherever practical; • separately collecting and streaming quantities of waste concrete, bricks, blocks, timber, metals, plasterboard, paper and packaging, glass and plastics, and offering them for recycling where practical. <p>Ensure that no waste from the Site is conveyed to or deposited at any place that cannot lawfully be used as a waste facility for that waste.</p>	Waste Sub Plan	
GC21 Preliminaries – 6.3	<p>Monitor and record the volumes of waste and the methods and locations of disposal.</p> <p>Submit a progress report every two months, and a summary report before Completion, on the implementation of waste management measures, including the total quantity of material purchased, the quantity purchased with recycled content, the total quantity of waste generated, the total quantity recycled, the total quantity disposed of and the method and location of disposal in the form of a <i>Waste Recycling and Purchasing Report</i> available on the ProcurePoint website</p> <p>With the <i>Waste Recycling and Purchasing Report</i>, submit waste disposal certificates and/or company certification confirming appropriate, lawful disposal of waste.</p>	Waste Sub Plan	

2.4 Objectives and Targets

The project has set the following Waste Management performance targets. These include current business plan environmental targets for the Business Unit and the whole of CPB Contractors:

Table 2: Lagging Indicators

Key Performance Indicator	Target	Time Frame	Actions to be Taken	Accountability
% of waste reused or recycled	75% of waste generated	12 months	Implementation of Waste Sub Plan	Environmental Manager

2.5 Key Environmental & Waste Management Stakeholders

Key waste management stakeholders for the Project will include:

- Principal's Authorised Representative Health Infrastructure
- CBRE
- CPB Contractors Pty Ltd
- Penrith City Council
- Office of Environment and Heritage (EPA)
- Building Compliance – Certifying Authority

Part B: Waste Management Plan

3. Scope

This Plan addresses the management and reporting of waste streams generated on the project.

Under the NSW Protection of the Environment Operations Act, 1997 (POEO Act), waste is defined as:

- any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or
- any discarded, rejected, unwanted, surplus or abandoned substance, or
- any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or
- any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or
- any substance prescribed by the regulations to be waste.
- a substance is not precluded from being waste merely because it is or may be processed, recycled, re-used or recovered.

Activities conducted on the project that have the potential to generate waste are provided below.

Table 2: Activities, Hazards and Risks

Project Activity	Environmental Hazard	Environmental Risk
Construction and demolition processes	Generation of waste product	Soil and water contamination
Plant maintenance	Generation of waste oil	Soil and water contamination
Operation and maintenance of offices, crib huts and camp facilities	Generation of general wastes	Unnecessary load on landfill availability

3.1 Project Compliance Requirements

3.1.1 Conditions of Project Environmental Approvals

The following is used as a guide for anticipated Conditions of Approval from the project approval process for *Demolition of the existing on grade carpark at Nepean Hospital, Kingswood*. *Final conditions are anticipated from State Planning Authority as part of the SSDA determination process and will be further addressed in this Plan when received from City Plan Services: as they apply to waste management.*

Table 3: Project requirements

Item/ Condition	Limit/Requirement
1	A Demolition Waste Management Plan shall be prepared by an appropriately qualified contractor prior to the commencement of works. The Waste Management Plan should be prepared in accordance with DECCW's "Waste Classification Guidelines (2008)" and the Protection of the Environment Operations Act 1997. Note – this plan
2	The Demolition Waste Management Plan is to include the following requirements and details: a) The type and volume of all waste materials (e.g. bricks, concrete, timbers, plasterboard and metals) is to be estimated prior to the commencement of works, with the destination for each waste identified. Waste should be re-used or recycled as much as practicable. Where not practicable, the location of a suitable waste disposal facility is to be identified.

Item/ Condition	Limit/Requirement
3	b) Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed disposal site. Frequency of collection should be identified.
	c) No burning or burying of waste is permitted on the site.
	d) Any bulk garbage bins delivered by authorised waste contractors are to be placed and kept within the property boundary.
4	The worksite should be left tidy and rubbish free each day prior to leaving the site and at the completion of works.
5	No hazardous materials or dangerous goods are to be used or stored on site.
6	All materials on-site or being delivered to the site must be wholly contained within the site. The requirements of the Protection of the Environment Operations Act 1997 are to be complied with when placing/stockpiling loose material or when disposing of waste products or during any other activities likely to pollute drains or watercourses.
7	The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.
8	All equipment and machinery should be secured against vandalism outside of working hours.
9	A copy of the approved and certified plans, specifications and documentation shall be kept on site at all times and shall be available for perusal by the relevant Authority.
10	Any contractor(s) must meet all workplace safety legislation and requirements.
11	No vehicle maintenance is permitted in the demolition areas except in emergencies.
	Any loose material stockpiles are to be stored within the temporary construction compound(s) and are to be protected from possible erosion.

3.2 Waste Streams

The following waste streams and waste classifications have been identified on Nepean Hospital and Integrated Ambulatory Services Redevelopment – Stage 1 works.

Table 4 Waste Streams

Waste	Classification	Potential Recovery/Reuse	Disposal (all tracked)
Green waste from pruning and timber off cuts	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Green waste would be reused as mulch onsite or provided to local schools for landscaping. 	<ul style="list-style-type: none"> Green waste from pruning to be removed by subcontractor. Timber off cuts to be segregated and removed by licensed contractor to licensed waste facility.
Excavated Natural Material (ENM)	General Solid Waste (Non Putrescible) – Resource Recovery Exemption	<ul style="list-style-type: none"> Where possible, all suitable fill materials would be used on site 	<ul style="list-style-type: none"> Wherever possible, ENM would be used on the project and excess material would be transferred to appropriately approved sites requiring ENM.
Mixed Spoil	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Where possible, all suitable fill materials would be used on site. 	<ul style="list-style-type: none"> Mixed unsuitable spoil would be transferred to appropriately approved waste facilities.
Demolition concrete	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Stockpiled and transported to recycling centre and recycled for project construction activities. 	<ul style="list-style-type: none"> Nil. Valuable resource.
Building rubble and structural element demolition materials	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Collected in designated collection areas and reused as much as practically possible. 	<ul style="list-style-type: none"> Mixed unsuitable materials would be transferred to appropriately approved waste facilities.

Waste	Classification	Potential Recovery/Reuse	Disposal (all tracked)
Waste metals	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Stockpiled and transported to recycling centre. 	<ul style="list-style-type: none"> Nil. Valuable resource.
General office waste – paper, cardboard, used printer cartridges.	General Solid Waste (Non Putrescible)	<ul style="list-style-type: none"> Office waste such as paper, cardboard boxes, comingled wastes (Cans, plastic bottles etc) and used printer cartridges would be recycled. 	<ul style="list-style-type: none"> Food wastes and non recyclables will be sent to landfill.
Asbestos or Asbestos Containing Material	Special Waste	<ul style="list-style-type: none"> Fragments of non-friable ACM identified from site investigations. Refer to JBS&G RAP. 	<ul style="list-style-type: none"> Asbestos will be remediated in accordance with the JBS&G RAP.
PCB containing capacitors	Special Waste	<ul style="list-style-type: none"> None currently identified/ Disposal 	<ul style="list-style-type: none"> Prior to demolition when the power is disconnected, inspect the light fittings. Metal PCB containing capacitors are to be removed, placed in plastic lined 200 litre drums and disposed of as PCB Scheduled Waste.

3.3 Project Objectives

Based on the project requirements, the findings of project risk management processes and the potential impacts to the environment or community, the following targets have been set for managing waste on the project.

Table 5: Waste management targets

Metric/Measure	Objective	Timeframe	Accountability
% of waste quantified in waste management reports	100%	At all times	Environmental Manager
% of regulated/hazardous wastes for which transfer certificates are retained	100%	At all times	Environmental Manager
Number of enforcement notices and penalties received from regulators and/or client	Zero	At all times	Environmental Manager
% waste recycled	75%	12 months	Project Manager

3.4 Controls Used to Manage Waste

Controls that are adequate to ensure compliance and to reduce risk to the lowest acceptable rating achievable are planned before any relevant works commence. Elimination of the waste is the first preference of control, followed by reuse and recycling. Controls used on this project include:

Table 6: Waste management controls

Control	Accountability
All wastes need to be classified, stored, tracked, transported and treated in accordance with contractual and regulatory requirements, including the use of licensed transporters and treatment facilities	Supervisor
The relevant licences of waste facilities utilised for the disposal or handling of waste will be obtained to ensure they are legally compliant.	Environmental manager
Storage containers (bins, skips, tanks, etc) are provided at each work area in sufficient numbers to facilitate segregation of waste at the source of generation, where ever possible. The correct bin type must be used to avoid contamination.	All
Containers are clearly sign posted to inform all project personnel of the correct material to be placed within each bin type. Containers are emptied at a frequency that is sufficient to ensure their correct use. If a bin needs to be collected contact your supervisor or project environmental representative	Supervisor
Burial or burning of waste is not permitted.	All
Excess concrete and concrete washout is not to be discharged to land or storm water; a concrete washout facility must always be used.	Supervisor
All waste data must be collated and tracked using Material Tracking Forms.	Environmental manager
An adequate number of fully maintained concrete washout pits will be maintained on the site at all times.	Supervisor
A Demolition Waste Management Plan shall be prepared by an appropriately qualified contractor prior to the commencement of works. The Waste Management Plan should be prepared in accordance with DECCW's "Waste Classification Guidelines (2008)" and the Protection of the Environment Operations Act 1997. Note this plan forms the Demolition Waste Management Plan	Environmental manager
The Demolition Waste Management Plan is to include the following requirements and details: <ul style="list-style-type: none"> a) The type and volume of all waste materials (e.g. bricks, concrete, timbers, plasterboard and metals) is to be estimated prior to the commencement of works, with the destination for each waste identified. Waste should be re- used or recycled as much as practicable. Where not practicable, the location of a suitable waste disposal facility is to be identified. b) Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed disposal site. Frequency of collection should be identified. c) No burning or burying of waste is permitted on the site. d) Any bulk garbage bins delivered by authorised waste contractors are to be placed and kept within the property boundary. 	Environmental Manager
The worksite should be left tidy and rubbish free each day prior to leaving the site and at the completion of works.	Supervisor
No hazardous materials or dangerous goods are to be used or stored on site.	Supervisor
All materials on-site or being delivered to the site must be wholly contained within the site. The requirements of the Protection of the Environment Operations Act 1997 are to be complied with when placing/stockpiling loose material or when disposing of waste products or during any other activities likely to pollute drains or watercourses.	Supervisor
The public way must not be obstructed by any materials, vehicles, refuse, skips or the like, under any circumstances.	Supervisor
All equipment and machinery should be secured against vandalism outside of working hours.	Supervisor

Control	Accountability
A copy of the approved and certified plans, specifications and documentation shall be kept on site at all times and shall be available for perusal by any officer of Council.	All
Any contractor(s) must meet all workplace safety legislation and requirements.	All
No vehicle maintenance is permitted in the demolition areas except in emergencies.	Supervisor
Any loose material stockpiles are to be stored within the temporary construction compound(s) and are to be protected from possible erosion.	Supervisor/Environmental manager
Where available, recyclable site and construction waste are to be recycled in accordance with the NSW Government's Waste Reduction and Purchasing Policy (WRAPP guidelines). Any waste oil is to be sent to an approved recycler.	Supervisor
Non-recyclable waste and containers are to be regularly collected and disposed of at a licensed landfill or other disposal site in the area.	Supervisor
Any bulk garbage bins delivered by Authorised Waste Contractors are to be placed and kept within the property boundary.	Project engineer
Waste management practices for the proposal are to follow the resource management hierarchy principles embodied in the Waste Avoidance and Resource Recovery Act 2001.	Environmental manager
No burning of vegetation or other materials is permitted on site or at the compound.	Supervisor
Disturbed areas and haul roads must be treated with dust suppressants (e.g. water trucks or chemical suppressants) especially in high risk areas and/or on during high risk days.	Supervisor
Stabilised access, rumble grids, wash bays or similar must be established for the entries site and exits to site to minimise mud on public roads. Sweepers shall be used periodically to clean public roads where mud has been deposited.	Supervisor
Traffic speed limit(s) are determined to minimise dust generation and must be adhered to at all times.	All
All construction plant and equipment must be maintained so they do not emit visible smoke for any period greater than: <ul style="list-style-type: none"> ■ 15 consecutive seconds for plant not being registered for use on public roads; and ■ 10 consecutive seconds for plant registered for use on public roads. 	Supervisor
Burning of any materials is prohibited onsite.	All
Competently designed and constructed rumble pads shall be established for the ingress and egress of all vehicles.	Project engineer
Air quality monitoring conducted in accordance with <insert relevant code, standard, guideline, etc> and at a frequency and at locations to confirm compliance with the regulatory limits will be conducted.	Environmental manager
No burning of vegetation or other materials is permitted	All
Dust generated during demolition activities is to be controlled by regular control measures such as on-site watering	Supervisor
All necessary maintenance for construction vehicles and equipment is to be undertaken during the demolition period.	Project engineer
Excessive use of vehicles and powered demolition equipment is to be avoided.	Supervisor
Exposed areas are to be progressively revegetated as soon as practical.	Supervisor

Vehicle wash down areas are to be established to ensure all mud and soil from construction vehicles is not carried onto public roads.	Project engineer
All vehicles involved in any demolition and departing the site with demolition materials, spoil or loose matter must have their loads fully covered before entering the public roadway.	
Any mud deposited on the road network due to truck movements to and from the site is to be cleaned up immediately.	

3.5 Waste Management Licenses

A search of the Protection of the Environment Operations Act (POEO Act) licensed facilities local to the project include:

Table 7: Licensed Waste Facilities

License number	Operator	Address	Fee Based Activity	License review due date
13426	Dial-A-Dump (EC) Pty Ltd – Eastern Creek Landfill (landfill)	Honeycomb Drive, EASTERN CREEK, NSW 2766		
20121	Dial-A-Dump (EC) Pty Ltd (recycling)	Honeycomb Drive, EASTERN CREEK, NSW 2766		
20836	BORAL CEMENT LIMITED	10 Bernera Road, PRESTONS, NSW 2170		
12418	BORAL RECYCLING PTY LIMITED	25 Burrows Road South, ST PETERS, NSW 2044		
1924	BENEDICT INDUSTRIES PTY LIMITED	14309 Heathcote Road, SANDY POINT, NSW 2171		

3.6 Waste Data Monitoring

Waste data is collected on the project to allow monthly reporting of the following:

- The quantity of each type of waste sent to landfill
- The quantity of each type of waste recycled
- The quantity of each type of waste reused
- The quantity of each type of hazardous/regulated waste generated on the project and:
 - Its method of treatment and disposal
 - The location of treatment and disposal
 - Copies of records confirming the legal transport, treatment and disposal
- Measurement of any reduction in waste generation that has been achieved

The quantity of waste in each solid waste stream is measured by weight and liquid waste stream by volume, with records provided by the waste transport contractor. Alternative measures may only be used when an economical alternative is not available.

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Appendices

Appendix A: Waste Management Plan- Estimate of Waste Quantities for Re-use, recycling and Disposal during Early Works.

WASTE MANAGEMENT PLAN FOR: Nepean Hospital and Integrated Ambulatory Services Redevelopment –Stage 1 Building Works

SSDA FOR PROPOSED NEW HOSPITAL TOWER AT NEPEAN HOSPITAL CAMPUS- Site Bounded by Somerset St, Derby St, Parker St & Great Western Highway.

DETAILS OF WASTE MANAGEMENT – EARLY WORKS PHASE: DEMOLITION & EXCAVATION & INGROUND SERVICES				
MATERIALS ON SITE				
Type of Materials	Estimated Volume (m ³)	Re-use and Recycling ON SITE- Proposed Re-use	Disposal	
			OFF – SITE (Recycling)	OFF SITE – Landfill
Asphalt/ Bitumen	1300 m ³	Nil proposed for re-use on site. Recycle off site.	Concrete Recyclers	
Concrete (Kerbs, gutters and concrete footpaths and footings)	250 m ³	Nil proposed for re-use on site. Recycle off site.	Concrete Recyclers	
Excavation Material from Early works Bulk Excavation	24,315 m ³	Minimal	Recycling proposed re-use off site: 24,315 m ³	
Metal (Demolition Light Poles, Bollards Crash Barriers & other miscellaneous steel/ metal work and off cuts)	64 m ³	Nil	B Metal Recyclers: Bingo –Recycling Dial a Dump	
Block work, retaining Walls, crib walls as required.	150 m ³	Nil	Bingo –Recycling Dial a Dump	

PVC Pipe	32 m ³	Nil	Bingo –Recycling Dial a Dump	
Terracotta/ Concrete Pipe	30 m ³	Nil	Bingo –Recycling Dial a Dump	
Garden Organics	64 m ³	Nil	Bingo –Recycling Dial a Dump	
Packaging – used pallets	20 m ³	Nil	Bingo –Recycling Dial a Dump	
Plasterboard	7 m ³	Nil		Kurnell or other Landfill site T.B.A.

Main structure Works to be included at later stage.

Appendix D: Construction Noise & Vibration Management Plan

Nepean Hospital - Stage 1

Construction Noise and Vibration Management Plan (For Construction)

SYDNEY
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MASCOT 2020
T: (02) 8339 8000

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

ABN: 11 068 954 343

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DOCUMENT CONTROL REGISTER

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Document Title	Construction Noise and Vibration Management Plan
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1 INTRODUCTION

Acoustic Logic Consultancy has been engaged to prepare a Noise and Vibration Management Plan to address noise and vibration impacts from demolition/excavation/construction associated with the Nepean Hospital Stage 1 Redevelopment.

The issues which will be addressed in this report are:

- Identification of potentially impacted nearby receivers.
- Identification of the noise and vibration standards which will be applicable to this project.
- Identify likely sources of noise and vibration generation and predicted noise levels at the nearby receivers.
- Formulation of a strategy to comply with the standards identified and mitigation treatments.

We note that the proposed construction hours include Saturday work from 7am to 5pm, which is outside of what is typically considered to be standard construction hours. This report therefore includes an assessment of the noise impact specifically addressing work in the periods (which is held to more stringent noise emission criteria compared to typical construction works).

2 SITE DESCRIPTION AND PROPOSED WORKS

The proposed development consists of:

- A fourteen-storey development with roof top helipad, and major plant rooms located on level 4 and roof level.
- Ground level emergency department, with ambulance bay adjacent to the eastern façade.
- Mixture of in-patient units, specialty areas and shell spaces.

Noise sensitive development in the vicinity of the site is as follows:

- Outside of Nepean Hospital Campus:
 - Residential development to the east (Somerset Street), west (Parker Street) and south (Derby Street).
 - Nepean Private Hospital which is located to the north-west, on the opposite side of Barber Ave.
- Within Nepean Hospital Campus:
 - A child care centre (to the east).
 - East Block (to the south). Three storey building with inpatient units and operating suites located on the northern façade facing the site.
 - North Block (2 storeys), Hope Cottage (1 storey) and the Doctors Accommodation (one Storey) to the west.
 - Drug and Alcohol, Gateway and Tresillian (to the north).

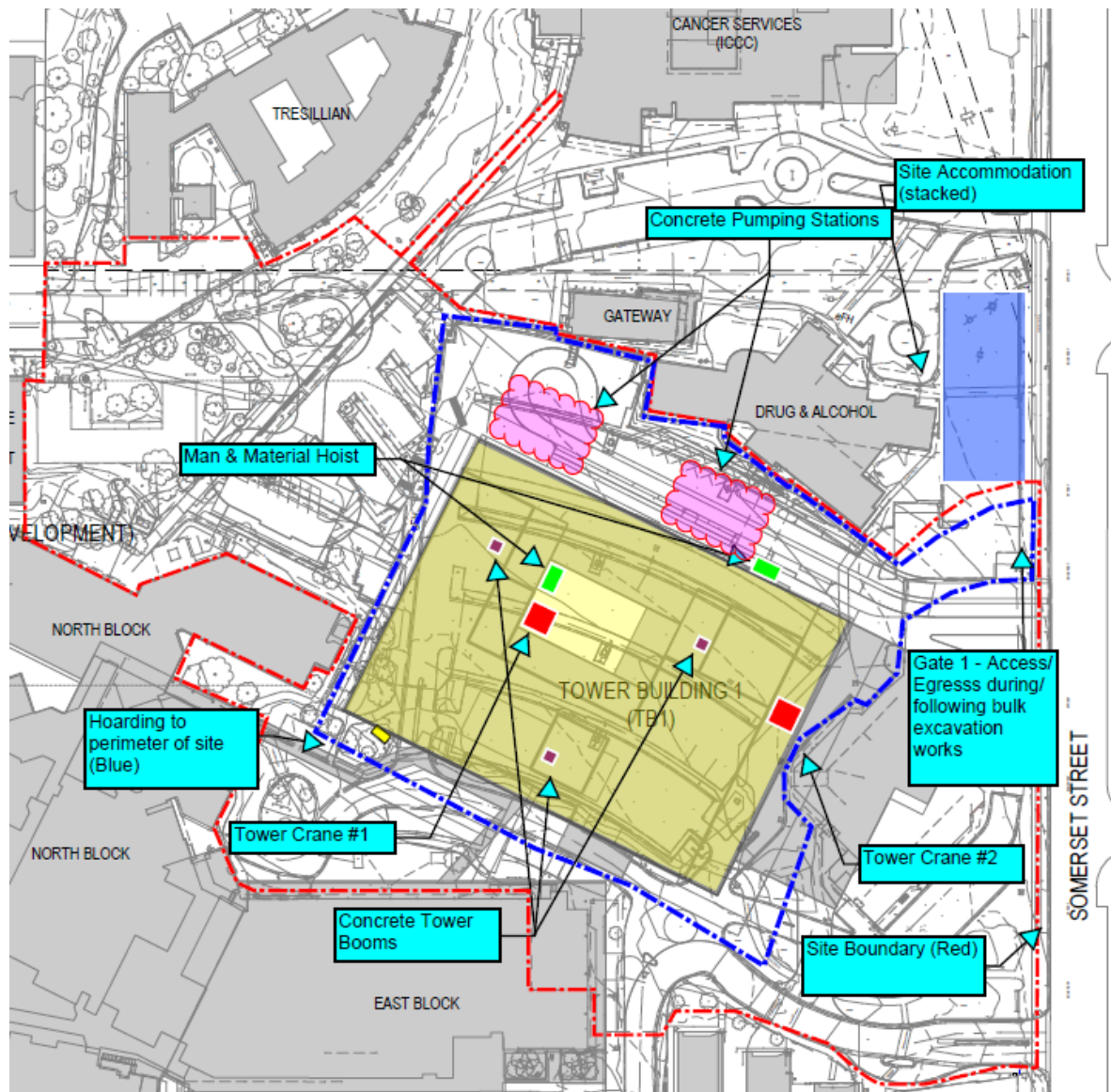
Refer to aerial photograph below showing site location and context.



Figure 1 – Site Context

Key considerations with respect to construction noise and vibration are as follows:

- Demolition works primarily will involve demolition of the existing on grade car park.
- Bulk excavation will be required. Given the geological conditions at the site, excavation is expected to be conducted using rock rippers (noise/vibration intensive equipment such as rock saws and hydraulic hammers is not expected to be required).
- Proposed piling method is to use bored piles. Use of a compactor will be required for a short period on the southern boundary prior to the commencement of piling works.
- Materials handling area (deliveries) and concrete pumping stations are proposed along the northern boundary of the site. Vehicular access is via a driveway on Somerset Street.
- Two tower cranes are proposed – one on the eastern façade of the new building, and one located centrally. Two hoists are proposed – one on the northern façade of the new building, and one located centrally.



3 NOISE AND VIBRATION CRITERIA

Construction noise management levels will be formulated with reference to the following documents:

- NSW EPA Interim Construction Noise Guideline (ICNG);
- Australian Standard AS 2107:2016.

With respect to the application of the above criteria:

- Development in the vicinity of the site includes both development that is part of the Hospital Precinct (Hope Cottage, North/East Block, Doctors Accommodation etc) as well as development that is not a part of hospital (Somerset Street/Parker Road residences, Private Hospital).
- For development that is located within the Hospital precinct, it is open for the proponent (Health Infrastructure) to negotiate noise goals/management strategies directly, as it is an impact within their own site. However for assistance, target noise goals at all locations in the vicinity of the hospital have been determined.

3.1 CONSTRUCTION NOISE

3.1.1 Noise to External Areas - NSW EPA Interim Construction Noise Guideline

We note that Saturday works are proposed to be conducted between 7am and 5pm. The 7am-8am and 1pm-5pm periods are considered to be outside of typical construction hours. Noise emission goals for construction work with during typical hour construction hours, and outside of these times is provided below.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest residences:

- *"Noise Management"* trigger level. Where construction noise is predicted to exceed the "noise effected" level at a nearby residence, the proponent should take reasonable/feasible work practices to ensure compliance with the "noise effected level". For residential properties, the "noise effected" level occurs when construction noise exceeds ambient levels by more than:
 - 10dB(A) $L_{eq(15min)}$ for work during standard construction hours (7am-6pm Monday to Friday and 8am to 1pm on Saturdays) and
 - 5dB(A) $L_{eq(15min)}$ for work outside of standard construction hours (7am-8am and 1pm-5pm on Saturday).
- *"Highly noise affected"* trigger level. Where noise emissions are such that nearby properties are "highly noise affected", noise controls such as respite periods should be considered. For residential properties, the "highly noise effected" level occurs when construction noise exceeds 75dB(A) $L_{eq(15min)}$ at nearby residences.

A summary of noise emission goals for both standard hours of construction and outside of standard hours is presented below.

Table 1 – Interim Construction Noise Guideline – Noise Trigger Levels – External Areas

Location	Noise Management Level Trigger level - $\text{dB(A)}_{\text{Leq}(15\text{min})}$ *	“Highly Noise Affected” Trigger Level - $\text{dB(A)}_{\text{Leq}(15\text{min})}$
Residences – Parker Street	58 (Standard Construction Hours) 53dB(A) (7am-8am and 1pm-5pm Saturday)	75
Residences – Somerset Street	57 (Standard Construction Hours) 52dB(A) (7am-8am and 1pm-5pm Saturday)	75
Commercial/ Private Hospital	70	N/A

*These noise levels are determined based on the background noise levels measured at the site conducted at Project Approval Stage.

Child Care Centre

With respect to the child care centre:

- Typically, a noise level of 55dB(A) is targeted as an external noise goal for outdoor play areas in child care centres.
- Given that construction noise impacts are temporary, it is reasonable to adopt a 60dB(A) noise target.

3.1.2 Noise to Internal Areas

Section 4.1.2 of the ICGN recommends the following construction noise management levels for hospital receivers:

Table 2 – Interim Construction Noise Guideline – Noise Trigger Levels – Internal Areas

Land Use	Management Level – $\text{dB(A)}_{\text{Leq}(15\text{ min})}$
Hospital Wards and Operating Theatres	Internal noise level – 45dB(A)

The ICGN does not have construction noise management levels for other noise sensitive areas within hospital receivers such as offices and consulting rooms.

Australian Standard AS2107:2016 is a commonly used standard for the assessment of noise impacted to internal areas.

Given that construction noise and a temporary, not a permanent noise source, it is reasonable that a more relaxed acoustic criteria is adopted as opposed to a straight application to the AS2107 recommended internal noise levels. In our experience, in the assessment of construction noise, it is common to adopt a noise target which is 5dB(A) more relaxed than the strict application of AS2107. This being the case, target internal noise levels for spaces other than wards and operating theatres is as follows:

Table 3 – Construction Noise Goals for Internal Areas Not Governed by AS2107

Land Use	AS2107 Noise Level	Proposed Construction Noise Goal – dB(A)_{Leq(15min)}
Private Office (Consulting Room, Treatment Room)	40dB(A)	45dB(A)
Open Plan Office	45dB(A)	50dB(A)
Hospital Accommodation	N/A	45dB(A)*

*Same noise goal as ward rooms is proposed.

3.2 CONSTRUCTION VIBRATION

3.2.1 Amenity Criteria

Vibration goals for the amenity of nearby land users are those recommended by the EPA document *Assessing Vibration: A technical guideline*. These levels are presented below:

Table 4 – Construction Vibration Goals - Amenity

Location	Time	Peak velocity (mm/s)	
		Preferred	Maximum
Continuous Vibration			
Residences	Daytime	0.28	0.56
Hospitals – Office Areas	When in use	0.56	1.1
Hospitals – Theatres	When in use	0.14	0.28
Impulsive Vibration			
Residences	Daytime	8.6	17
Hospitals – Office Areas	When in use	18	36
Hospitals – Theatres	When in use	0.14	0.28

3.2.2 Structure Borne Vibration Damage Criteria

German Standard DIN 4150-3 (1999-02) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (1999-02) are presented in Table 1.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 5 - DIN 4150-3 (1999-02) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms ⁻¹)			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

4 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE SOURCES

Typically, the most significant sources of noise or vibration generated during a construction project will be demolition, excavation, civil works (compaction, asphaltting) and piling.

Table 6 - Sound Power Levels of the Proposed Equipment

EQUIPMENT /PROCESS	SOUND POWER LEVEL dB(A)*
Demolition and Excavation/Civil Works Phase	
Truck	105
Excavator with bucket	110
Rock Ripper	110
Compactor (Vibratory)	110
Piling (screw/augured)	105
Construction Phase	
Crane (Electric)	95
Bobcat (In Material Handling Area)	100
Concrete Vibrator	105
Hoist	100
Powered Hand Tools – external areas (formworking, façade etc)	95-100
Powered Hand Tools – Internal areas	95-100 (however noise emitted will be reduced as a result of building façade)

*The nominated Sound Power Levels take into account modifying factors as applicable under the NSW Noise Policy for Industry.

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

5 CONSTRUCTION NOISE ASSESSMENT

The predicted noise levels during demolition/construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. For many of the work areas, the distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented below. Predictions take into account the following:

- Noise reduction as a result of distance.
- When predicting noise impacts to internal areas of nearby development, a noise reduction of 25dB(A) through the (closed) façade of the noise impacted building is assumed (expected for 6mm glass or similar).
- Where applicable, noise screening provided by the solid plywood hoarding proposed to the eastern site perimeter (see section 6). This will provide screening to ground level works (excavation, piling, concrete pump, work zone noise).

5.1 DEVELOPMENT *OUTSIDE* OF NEPEAN HOSPITAL PRECINCT

Table 7 – Predicted Noise Generation – Somerset Street Residences*

Activity	Predicted Level – dB(A) _{Leq(15min)}	Noise Management Level dB(A) _{Leq(15min)}	Comment	
Phase – Demolition/Excavation/Civil Phase				
Excavator – Dozer	45-50	<p>Noise Management Trigger Level</p> <p>57dB(A) – Standard Construction Hours</p> <p>52dB(A) – 7am-8am and 1pm-5pm Saturday</p> <p>Highly Noise Affected Trigger Level</p> <p>75dB(A)</p>	Complies – Standard and Extended Hours Trigger Levels.	
Bulk Excavation – Rock Ripper	50-55		Complies – Standard Hours Trigger Levels. Minor Exceedance of Outside of Hours Trigger Level.	
Compactor (Vibratory)	50-52		Complies – Standard and Extended Hours Trigger Levels.	
Piling (Augured)	45-50		Complies – Standard and Extended Hours Trigger Levels.	
Phase – Construction Phase				
Crane (Electric)	45		Complies – Standard and Extended Hours Trigger Levels.	
Concrete Pump	50		Complies – Standard and Extended Hours Trigger Levels.	
Concrete Vibrator	55-60		Exceedance of Trigger Level when working on the Eastern façade above Hoarding Level.	
Bobcat	45-50		Complies – Standard and Extended Hours Trigger Levels.	
Hoist	50		Complies – Standard and Extended Hours Trigger Levels.	
Hand tools – external areas.	50-55	Minor exceedance of Outside of Standard Hours Trigger Level when Working on Eastern Façade above hoarding level.		
Hand tools – internal areas.	<40	Complies – Standard and Extended Hours Trigger Levels.		

*Predictions take into account noise screen along eastern edge of the site as recommended in section 6.

Table 8 – Predicted Noise Generation – Nepean Private Hospital

Activity	Predicted Level – dB(A)_{Leq(15min)} Internal Area	Noise Management Level dB(A)_{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	<30		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	<35		Complies – Standard and Extended Hours Trigger Levels.
Compactor (Vibratory)	<30		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	<30		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<30		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<30		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	<30		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<30		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<30		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	<30		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

5.2 DEVELOPMENT WITHIN NEPEAN HOSPITAL PRECINCT

Table 9 – Predicted Noise Generation – Hope Cottage/Doctors Accommodation/North Block

Activity	Predicted Level – dB(A) _{Leq(15min)} Internal Area	Noise Management Level dB(A) _{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-50		Minor Exceedance when working near western boundary.
Bulk Excavation – Rock Ripper	35-55		Exceedance when working near western boundary.
Compactor (Vibratory)	40		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-50		Minor Exceedance when working near western boundary.
Phase – Construction Phase			
Crane (Electric)	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	45-50		Minor Exceedance when using western pumping station.
Concrete Vibrator	30-50		Minor Exceedance when working near western boundary.
Bobcat	25-40		Complies – Standard and Extended Hours Trigger Levels.
Hoist	40		Complies – Standard and Extended Hours Trigger Levels..
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 10 – Predicted Noise Generation - East Block

Activity	Predicted Level – dB(A)_{Leq(15min)} Internal Area	Noise Management Level dB(A)_{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 45dB(A) – Internal Areas	
Excavator – Dozer	30-50		Minor Exceedance when working near southern boundary.
Bulk Excavation – Rock Ripper	35-55		Exceedance when working near southern boundary.
Compactor (Vibratory)	40-55		Exceedance when working near southern boundary.
Piling (Augured)	30-50		Minor Exceedance when working near southern boundary.
Phase – Construction Phase			
Crane (Electric)	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	30-50		Minor Exceedance when working near southern boundary.
Bobcat	<35		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 11 – Predicted Noise Generation – Drug and Alcohol

Activity	Predicted Level – dB(A)_{Leq(15min)} Internal Area	Noise Management Level dB(A)_{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		<u>Noise Management Trigger Level</u> 45dB(A) – Internal Areas	
Excavator – Dozer	30-45		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	35-50		Minor Exceedance when working near northern boundary.
Compactor (Vibratory)	<40		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-45		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<50		Exceedance of trigger level.
Concrete Vibrator	30-45		Complies – Standard and Extended Hours Trigger Levels..
Bobcat	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	30-45		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<30		Complies – Standard and Extended Hours Trigger Levels.

Table 12 – Predicted Noise Generation – Tresillian

Activity	Predicted Level – dB(A)_{Leq(15min)} Internal Area	Noise Management Level dB(A)_{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		<u>Noise Management Trigger Level</u> 45dB(A) – Internal Areas	
Excavator – Dozer	30-35		Complies – Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	35-40		Complies – Standard and Extended Hours Trigger Levels.
Compactor (Vibratory)	<35		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	30-35		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	<35		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	<40		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	<35		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<35		Complies – Standard and Extended Hours Trigger Levels.
Hoist	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	<35		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – internal areas.	<35		Complies – Standard and Extended Hours Trigger Levels.

Table 13 – Predicted Noise Generation – Child Care Centre

Activity	Predicted Level – dB(A)_{Leq(15min)} External Area	Noise Management Level dB(A)_{Leq(15min)}	Comment
Phase – Demolition/Excavation/Civil Phase		Noise Management Trigger Level 60dB(A) – External Areas	
Excavator – Dozer	40-60		Complies with Standard and Extended Hours Trigger Levels.
Bulk Excavation – Rock Ripper	45-65		Exceeds Trigger Level when working on Eastern Boundary
Compactor (Vibratory)	<55		Complies – Standard and Extended Hours Trigger Levels.
Piling (Augured)	40-60		Complies – Standard and Extended Hours Trigger Levels.
Phase – Construction Phase			
Crane (Electric)	55		Complies – Standard and Extended Hours Trigger Levels.
Concrete Pump	50		Complies – Standard and Extended Hours Trigger Levels.
Concrete Vibrator	50-75		Complies – Standard and Extended Hours Trigger Levels.
Bobcat	<45		Complies – Standard and Extended Hours Trigger Levels.
Hoist	60		Complies – Standard and Extended Hours Trigger Levels.
Hand tools – external areas.	50-70		Exceeds Trigger Level when working on Eastern Boundary when working above Hoarding Level
Hand tools – internal areas.	<55		Complies – Standard and Extended Hours Trigger Levels.

*Predictions take into account noise screen along eastern edge of the site as recommended in section 6.

5.3 DISCUSSION

5.3.1 Noise Impacts

5.3.1.1 Noise Impacts *Outside* of Nepean Hospital Precinct

- Nepean Private Hospital – Construction noise impacts are predicted to be compliant with Noise Management Levels.
- Somerset Street residences.

Provided that the noise screen as detailed in section 6 is implemented:

- During Standard Construction Hours - Noise impacts are expected to generally be compliant with Noise Management Levels.
- During the Outside of Standard Hours Period (7am-8am and 1pm-5pm Saturday) - Noise impacts are expected to generally be compliant with Noise Management Levels with the exception of:
 - Noise from use of rock rippers on the eastern portion of the site.
 - Noise from powered hand tools and concrete vibrators when located above the hoarding level and on the eastern portion of the site.

5.3.1.2 Noise Impacts *Within* the Hospital Precinct

Exceedances of Noise Management Levels are predicted as follows:

- When working near the northern boundary, exceedances are predicted at the Drug and Alcohol Building. Noise from concrete pumps and vehicles in the Work Zone create the greatest impact. Noise from the use of rock rippers also causes a minor exceedance of the Noise Management Level.
- When working near the Eastern boundary, powered hand tools (form working), concrete vibrators and rock rippers result in exceedances of the 60dB(A) noise goal for the outdoor area of the Child Care Centre. Noise from powered hand tools and concrete vibrators once above the hoarding (noise screen) have the most significant exceedances.
- When working near the southern boundary (nearest to East Block), exceedances of noise management levels are predicted from use of rock rippers, compaction works and to a lesser degree general excavation and use of concrete vibrators in close proximity to the East Block façade.
- When working near the western boundary (nearest to North Block, Doctors Accommodation, Hope Cottage), exceedances of noise management levels are predicted from use of rock rippers, compaction works and to a lesser degree general excavation and use of concrete vibrators.

5.3.2 Vibration Impacts

We note that use of hydraulic hammers and vibrated piling (the most vibration intensive construction activities) is not proposed other than in localised areas (lift overrun).

This being the case, it will be compaction work (on the southern boundary) and rock ripping that create the greatest risk of vibration impact.

See section 6 for recommendations regarding vibration monitoring for the East and North Blocks.

6 RECOMMENDATIONS

6.1 NOISE IMPACTS OUTSIDE OF HOSPITAL PRECINCT

Given the potential impact on development outside the hospital precinct (Somerset Street residences) the following is recommended:

- Noise Screen – A 2.7m high plywood hoarding is recommended along the eastern boundary of the site in order to protect the Somerset Street residences (and the Child Care Centre).
- Major concrete pours (slabs/decks) on the eastern facade should not be conducted on Saturdays (before 8am or after 1pm) given the impact of the use of concrete vibrators/slab finishing equipment, particularly once located above the hoarding. Minor concrete pours on the east façade (ie core walls, columns etc) are acceptable on Saturdays. Away from the eastern façade, concrete pours are acceptable on Saturdays.
- If feasible, the eastern crane should either be electric, or should use a diesel power source which is located at ground level (and therefore screened by the hoarding).
- Notification should be provided to residences of the duration of the excavation/rock ripping period.
- Vehicles are not to typically arrive on site prior to 7am, and should turn off their engines when idling. Trucks should wait on site, and not on Somerset Street. In the event a special delivery/concrete truck is required to arrive on site prior to 7am, access must be given to enable the truck to move away from Somerset Street.
- Trucks and bobcats to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours. Avoid careless dropping of construction materials into empty trucks.
- In the event of complaint, the procedures identified in sections 7 8 and 9 are to be followed.
- In the event that use of a rock hammer is required for isolated events (lift overrun or similar) it is recommend that this is not done before 8am or after 1pm on a Saturday.
- Respite periods – given that noise emissions are predicted to be generally compliant with EPA guidelines (and provided that the restrictions on Saturday work are observed, as detailed above), use of respite periods is not warranted.

6.2 NOISE IMPACTS WITIN HOSPITAL PRECINCT

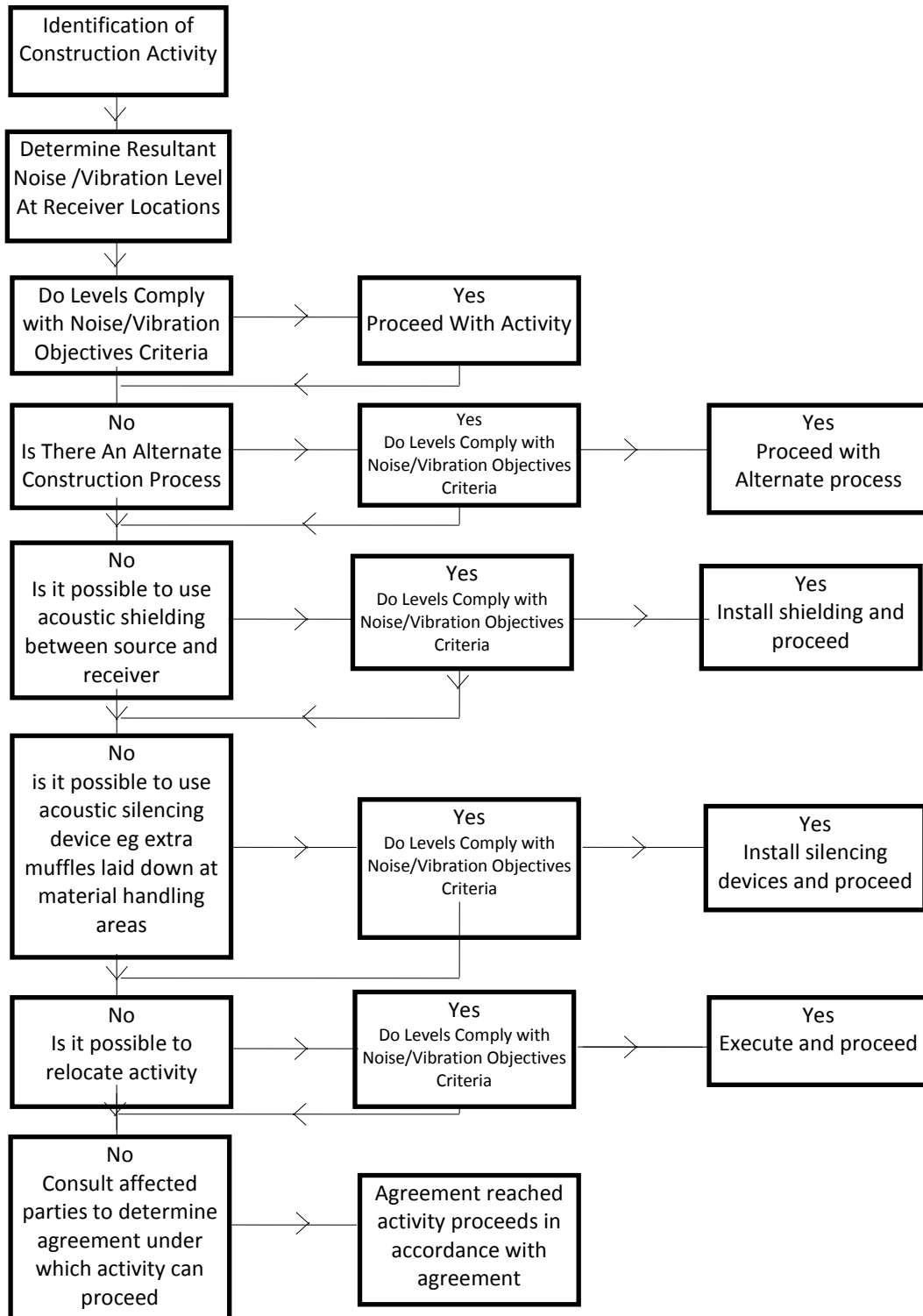
With respect to noise impacts within the Nepean Hospital Precinct, given these buildings are a part of the hospital, it is open for hospital management to negotiate noise mitigation directly users. However the following is to be considered:

- *Drug and Alcohol Building* - Noise impact of concrete pumps and vehicles in the Northern Workzone on the Drug and Alcohol building will be moderate. A localised screen around the northern side of the pumping area is to be considered. Screen would be plywood, and as high as the pump. Alternatively, secondary glazing (Magnetite or similar) to any private offices/consult rooms on the southern façade of the Drug and Alcohol Building could be used.
- *Hope Cottage, Doctors Accommodation* – There will be a moderate noise impact from excavation, rock ripping and to a lesser degree from concrete pumps and vibrators. If feasible, hospital management should allocate room use during the daytime such that those rooms do not face the work site. If rooms facing the work site are anticipated to be used during daytime hours, Magnetite secondary glazing to these rooms is recommended.

- *North Block and East Block:*
 - There will be a moderate noise impact from excavation, rock ripping and to a lesser degree from concrete vibrators.
 - Use of secondary glazing to these buildings is not likely to be feasible:
 - Compaction works – this is anticipated to be short duration and it is recommended that Health Infrastructure advise hospital management of anticipated duration of works. If feasible, a roller (as opposed to vibratory) compactor is recommended.
 - Excavation using rock ripper – if feasible, work within 40m of the northern façade of the East Block and within 40m of the eastern façade of the North block would not commence prior to 7.30am to reduce the noise impact on In Patient Units facing the construction site.
 - In the event that use of a rock hammer is required for isolated events (lift overrun or similar) it is recommended that this is not done before 8am or after 1pm on a Saturday.
 - Noise monitoring at the commencement of ripping work is recommended to determine if any further protection (or scheduling of works) is required to the operating suites/day surgeries in North and East Block.
- *Child Care Centre:*
 - A 2.7m high plywood hoarding is recommended along the eastern boundary of the site in order to protect the Child Care Centre.
 - If feasible, the eastern crane should either be electric, or use a diesel power source which is located at ground level (and therefore screened by the hoarding).
 - If there are any windows of sleeping areas directly facing the construction site, secondary glazing (Magnetite or similar) is recommended.
- *Vibration Monitoring.*
 - During the excavation, compaction and piling process, unattended vibration monitoring is recommended at the following locations:
 - East Block – Monitor on Operating Suite level and In Patient Unit level.
 - North Block – Monitor on Day Surgery level and In Patient Unit level.
 - The proposed vibration monitoring equipment is a TEXCEL type monitor with externally mounted tri-axial geophone.
 - The monitors are proposed to be fitted with GSM modems and will remotely signal up to five mobile phones indicating any exceedance of the prescribed vibration criteria.
 - At least initially, SMS warning trigger to be set at 0.5mm/s for the Operating Suite/Day Surgery and 1mm/s for the Inpatient Units.

7 CONTROL OF CONSTRUCTION NOISE AND VIBRATION – PROCEDURAL STEPS

The flow chart presented below illustrates the process that will be followed in assessing construction activities.



8 ADDITIONAL NOISE AND VIBRATION CONTROL METHODS

In the event of complaints, there are a number of noise mitigation strategies available which can be considered.

The determination of appropriate noise control measures will be dependent on the particular activities and construction appliances. This section provides an outline of available methods.

8.1 SELECTION OF ALTERNATE APPLIANCE OR PROCESS

Where a particular activity or construction appliance is found to generate excessive noise levels, it may be possible to select an alternative approach or appliance. For example; the use of a hydraulic hammer on certain areas of the site may potentially generate high levels of noise. Undertaking this activity using bulldozers, ripping and/or milling machines will result in lower noise levels.

8.2 ACOUSTIC BARRIER

Given the position of adjacent development, it is unlikely that noise screens will provide significant acoustic benefit for commercial or residential receivers, but will provide noticeable improvement for those on ground level.

The placement of barriers at the source is generally only effective for static plant. Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source.

Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15dB(A) can be effected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance that is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10mm or 15mm thick plywood (radiata plywood) would be acceptable for the barriers.

8.3 TREATMENT OF SPECIFIC EQUIPMENT

In certain cases it may be possible to specially treat a piece of equipment to dramatically reduce the sound levels emitted.

8.4 ESTABLISHMENT OF SITE PRACTICES

This involves the formulation of work practices to reduce noise generation. A more detailed management plan will be developed for this project in accordance to the construction methodology outlining work procedures and methods for minimising noise.

8.5 COMBINATION OF METHODS

In some cases it may be necessary that two or more control measures be implemented to minimise noise.

9 DEALING WITH COMPLAINTS

Should ongoing complaints of excessive noise or vibration criteria occur immediate measures shall be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices.

If a noise complaint is received the complaint should be recorded. Any complaint form should list:

- The name and address of the complainant (if provided);
- The time and date the complaint was received;
- The nature of the complaint and the time and date the noise was heard;
- The name of the employee who received the complaint;
- Actions taken to investigate the complaint, and a summary of the results of the investigation;
- Required remedial action, if required;
- Validation of the remedial action; and
- Summary of feedback to the complainant.

A permanent register of complaints should be held.

10 CONCLUSION

A noise and vibration assessment has been undertaken of the proposed construction works to be undertaken at the Nepean Hospital Stage 1 works.

Potential noise and vibration impacts on nearby buildings (both inside of and outside of the hospital precinct) have been assessed.

Provided that the mitigation techniques and the vibration monitoring as recommended in sections 6, 7, 8 and 9 of this report are adopted, noise and vibration impacts on the adjacent buildings will be minimised.

Please contact us if you have any queries.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'T. Taylor', is positioned below the closing text.

Acoustic Logic Consultancy Pty Ltd
Thomas Taylor

Appendix E: Organisational Chart

ORGANISATIONAL CHART

